PEST CONTROL

MAY 1952

EVERY MONTH SINCE 1933

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Magazine of the Urban and Industrial Pest Control and Sanitation Service Industries for 20 Years

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U.S.I.

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Spray Keeps State Fair Free Of Flies

ONE of the most remarkable instances of fly control was accomplished at the recent Arizona State Fair at Phoenix, Ariz. Countless visitors, among the estimated attendance of 175,000, remarked that this was the first time when the cattle and sheep barns at the Fair were totally without flies.

The remarkable part about it was that, although several million cubic feet of space were sprayed daily in the stock exhibition barn, this fly control only cost an average of two cents per animal. It figured out to a commercial cost of a gallon of spray a day, or about $18.

The insecticide used was Pyrenone, a combination material consisting of pyrethrum and piperonyl butoxide, and it was applied by use of a fog generator.

The cattle barn in particular, where actual counts were made, was almost without any fly population during the Fair days. And there was so much interest in the fact among visiting farmers and ranchers, that special radio and television programs were put on the air in regard to this demonstration of fly control.

STATE FAIR — Success of Pyrenone in controlling flies on a tough assignment was reported in *Arizona Stockman.*

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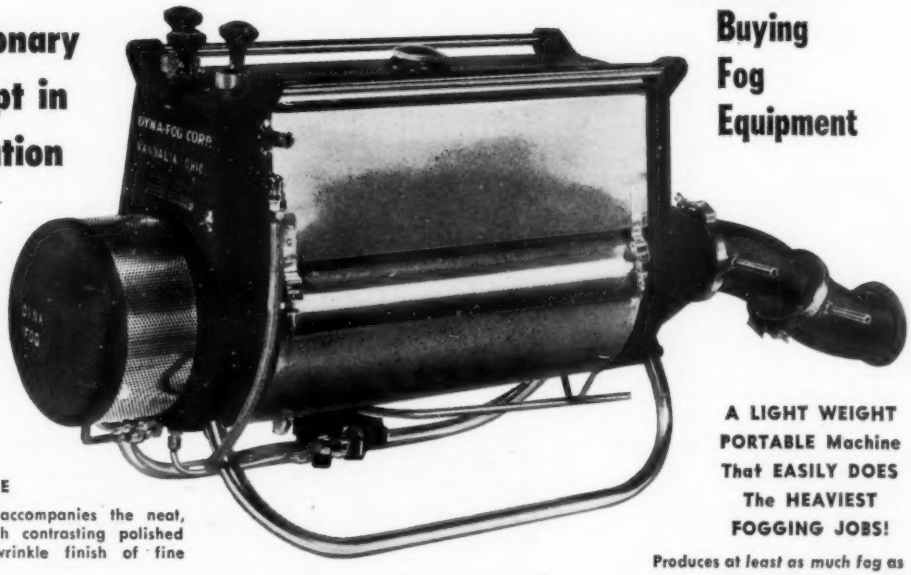

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Opportunities Unlimited V

Fifty million dollars is the conservative estimate of the amount of work pest control operators do annually, according to National Pest Control Association executive secretary, William O. Buettner. We think it's considerably more than that.

But whatever the *actual* figures are, they could be much larger if PCOs would take advantage of the opportunities all around them. In the last four months we have pointed out some of the areas which can be explored. There is no need to compete with one another for business that already exists if you develop the new fields that are waiting for and can use professional pest control service.

The field of custom spraying for insect control is another "natural" for PCOs. Estates, parks, orchardists, etc. want trained men who know the problems and their solutions to come in and do a job for them, instead of investing in large equipment which may be used once or twice a year. PCOs can use such equipment economically if they promote this kind of business.

Every PCO in this country has benefited from the publicity program started by the NPCA. You are becoming better known, more respected, and will be called upon to do a greater variety of work. Alert PCOs will go out to expand in those yet untouched fields that require their special brand of know-how.

James A. Nelson

Editor

PEST CONTROL

EVERY MONTH SINCE 1933

JAMES A. NELSON
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MAY, 1952 VOL. 20, NO. 5

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Pest Control Made *Easy?*

All homeowners have to do to get rid of ants, cockroaches, bedbugs and silverfish is to pick up the April 1952 copy of *Reader's Digest*, read the article "How to Get Rid of Household Insect Pests" and they'll know exactly what to use and where to use it. That control measures suggested may be directly opposed to regulations set forth by the government seems of little concern to author C. Lester Walker, whose article is based on a report provided the magazine by the York Research Corporation, Stamford, Conn.

"The most effective and practicable killer of the various insects which most often infest a home is chlordane," the article says. To kill bedbugs, the *Reader's Digest* recommends, among other things, "the insecticide should be painted around . . . *the seams and tufts of your mattresses.*"

The Production and Marketing Administration published on September 15, 1951, Interpretation 19 of the Regulations for the Enforcement of the Federal Insecticide, Fungicide and Rodenticide Act concerning the labelling of household insecticides containing chlordane. That regulation states, "*There shall be no directions for treatment of clothing, bedding, beds, mattresses, pillows or furniture and no claims or directions for bedbugs, or fabric pests in furniture.*"

To further contradict Interpretation 19 the *RD* advises the housewife, " . . . if clothes are already moth infested it (chlordane) should be *sprayed on.*" For carpet beetles, author Walker says, "*If carpet beetles already infest rugs or clothing, you need a quick killer. Then use chlordane-content insecticide. Spray rugs on both sides, spray floor cracks and baseboards. Use a coarse-stream spray, not a finely atomized one.*"

To be of utmost benefit the popular publication's article even recommends the type of formulations milady should buy: " . . . try to use *water emulsions* or mixtures rather than oil solutions. . . Oil solutions are more toxic, may kill house plants, and are usually highly flammable." Do you suppose there'd be any chance of *staining* when such recommended formulations are applied to that expensive piece of furniture or rug the colors of which are not water-fast? Who's liable when this happens? The *Reader's Digest?*

In no way would we suggest there be any limitations on *Reader's Digest's* right to publish articles that are in the public's interest. But when its editors delve into a field which is so technical and beset with enough headaches as it is, we question the lack of judgment which prompted this well-read magazine to publish such an ill-advised article as this without first checking with recommendations of the Production and Marketing Administration and the National Pest Control Association. Both would have been more than willing to cooperate to see that *proper* instructions were given; each is vitally concerned.

It is articles like this one for the general public that bring on more legislation that curtails the use of such effective insecticides as chlordane, which are extremely valuable when applied correctly by properly trained personnel.

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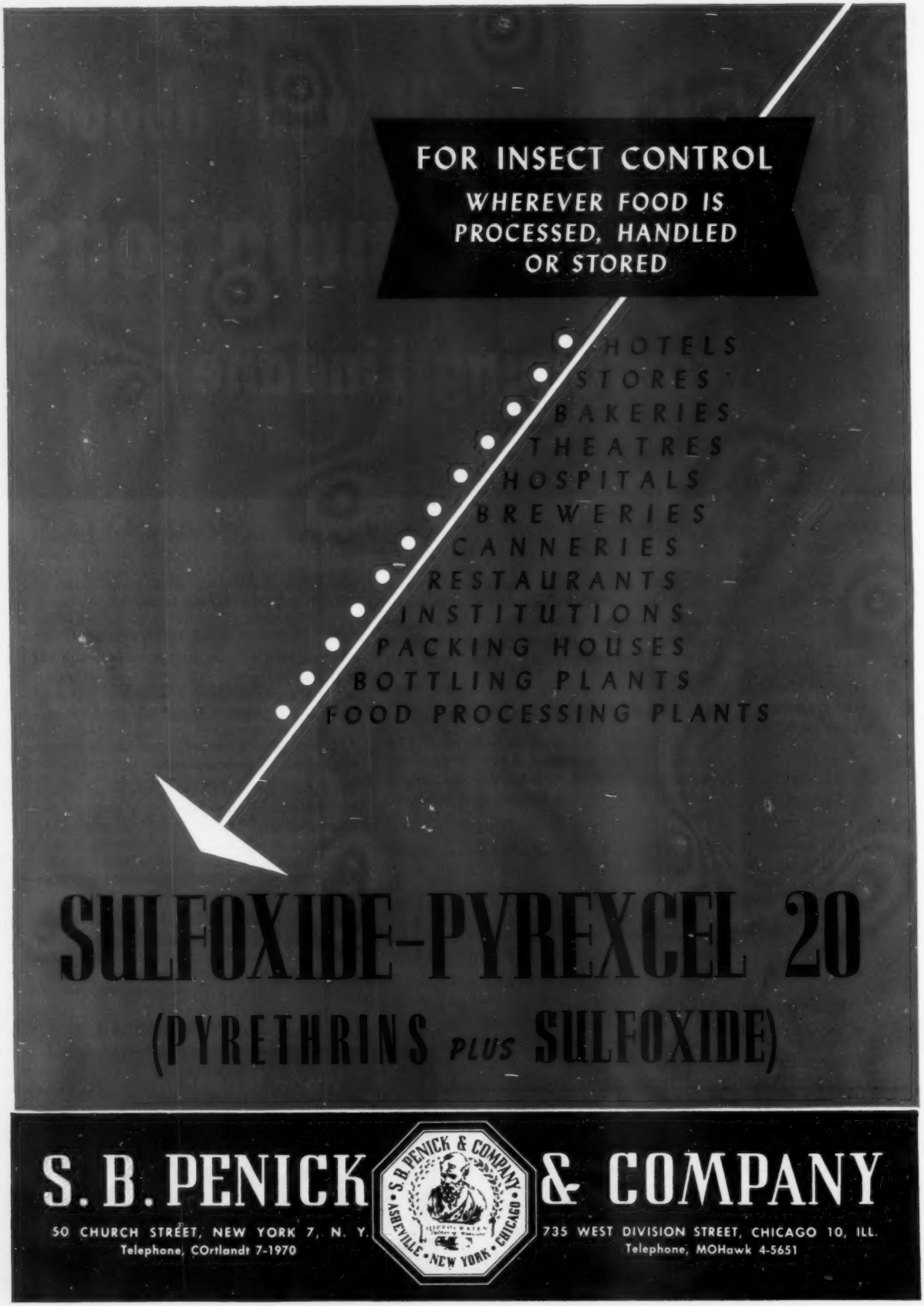
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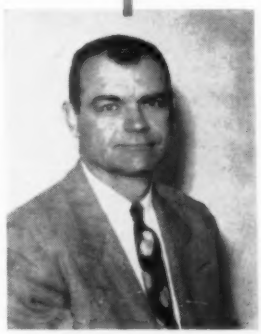
how does pest control fit in

Food Plant Operations?

Written for Pest Control magazine and presented at the 1952 convention of the Pest Control Operators of California in Bakersfield on February 25.

by



Donald H. Little
Director, Dept. Of Sanitation
Dried Fruit Ass'n. Of Calif.
San Francisco, Calif.

IN THIS REVIEW of the pest control functions in a food plant sanitation program, attention is first directed to a primary prerequisite; namely, close coordination with normal plant operations. Since attainment of objectives must result from the competence of persons directing the work, a lack of cooperation from plant management can completely defeat the best efforts of a program administered by food plant employees or by a commercial PCO.

How To Plan Program

It is our first recommendation that the inauguration of a pest control program should be begun with a conference to establish a complete understanding between plant management and persons who will direct the program. In our experience failures may often be attributed to a lack of understanding on the part of plant heads. So often a food handler facing an infestation problem feels that the mere employment of either a competent specialist or a commercial pest control operator's service will solve his problem. In this he doesn't realize "what it takes" to insure adequate treatment. Accordingly, our advice to the sanitarian or the commercial pest control operator calls for thoughtful advance planning and assurance of cooperation from management.

Since any infestation, animal or insect, can sooner or later be traced back to that which enters a plant, operation of both phases of control; namely, *prevention* and *extermination*, must include not only the manner in which *everything* in the plant is handled, but also the *plant structure* and conditions on adjacent property. Therefore, accomplishment of pest control program objectives demands management's cooperation in giving attention to everything from the plant itself and the property on which the plant is situated, to the handling and placement of everything in the building. All of this is of as much importance as the work of one who may direct procedures, including fumigation, trapping, poisoning, etc.

Even acts and behavior of employees have a bearing on results. Therefore, if an employee or a PCO has concern for his reputation when he undertakes to service a plant, he should see to it that his employer knows not only *what he wants* but *what it takes.*

What Is "Contamination"?

As a preface to some further review of food plant pest control and to briefly enumerate objectives, we quote in part from the Federal Food, Drug and Cosmetic Act of 1938:

> "Sec. 402. A food shall be deemed to be adulterated . . . (a) (1) If it bears or contains any poisonous or deleterious substance which may render it injurious to health; . . . or (2) if it bears or contains any added poisonous or added deleterious substance which is unsafe within the meaning of Section 406; or (3) if it consists in whole or in part of any filthy, putrid, or decomposed substance, or if it is otherwise unfit for food; or (4) if it has been prepared, packed, or held under insanitary conditions whereby it may have become contaminated with filth, or whereby it may have been rendered injurious to health; . . . "

Full understanding of these words and the conditions which fulfill their meanings is essential to food firms and to pest control men servicing food plants.

The exterminating functions of pest control men in food plants are affected by above clauses (1) and (2) which imply careful use and application of insecticides, fumigants and rodenticides, and by clauses (3) and (4) which embody any remainder of detectable extraneous material in the finished product and in the plant which may result from exposure to infestations of any nature.

Beyond the scope of pest control, the statute provisions cited

above have broad application to everything from serious inferiority in portions of the product itself, to extraneous materials which may not in themselves be offensive but which are not naturally or for any good cause an inseparable part of the particular foodstuff.

Existence of any pest or pest leavings in the plant constitute a condition which *may* contaminate food and can well result in an adulteration charge whether or not there are signs of contamination present in the finished product.

Insects and rodents in a food plant include everything from live specimens to their fragmentary remains or leavings. In most foodstuffs, the raw material's nature and origin is such that a sanitation program must operate with the continual presumption that there may be contamination from infestation. Beyond this the continuing probability of at least temporary habitation of insects and rodents in a plant constitutes sufficient reason for a continuous preventive program directed at not only the pests but the obliteration of their evidences. With respect to the latter, research shows that a substantial measure of contamination comes continuously from plant surfaces as well as from soils and atmosphere.

Fight Contamination, Not Just Pests

In pest control service, and for that matter in the whole program of food sanitation, we cannot realistically expect to *completely* prevent, to *completely* exterminate and to *completely* eliminate objectionable contaminations. Studies demonstrate that in the most highly refined products it is seldom possible to remove the last vestige of contamination to which the raw material and even the finished products are exposed in the process of their handling on the farm and in the plant.

Enforcement agencies and enlightened food firms seek to obtain such practical results as have been demonstrated possible from careful administration of continuous prevention, extermination and other protective measures. But the mere fact of fumigation, trapping and poisoning serves no purpose if in some portion of a plant, by reason of poor placement of machinery or merchandise, or a structural deficiency, an inaccessible breeding place, harborage or entry for pests is present. The ultimate aim of any adequate food plant pest control program is the prevention of *plant* and *food* contamination, not merely the killing of vermin.

Control Requirements

As we see it, to operate within the scope of the adulteration laws and to satisfy consumers, food firms require the following pest control service: (1) Thorough and frequent inspection for pest infestation; (2) *Rapid* extermination of any pests present, and (3) Detailed recommendations for preventive control measures. Food companies can get these from specialized commercial pest control operators, or from trained people in their own direct employ. The proper performance of these three services will be more expensive than the ordinary routine pest control work used by many food companies, service which amounts to little more than "going through the motions."

In addition to these services, to fully accomplish prevention of plant and food contamination, plant management must in turn act upon the detailed preventive control instructions required by the PCO in charge. Preventive recommendations which are proper and will be effective depend upon many factors, such as type of pest involved, location of the plant, structural condition of the plant, methods of handling products and materials in the plant, and many others.

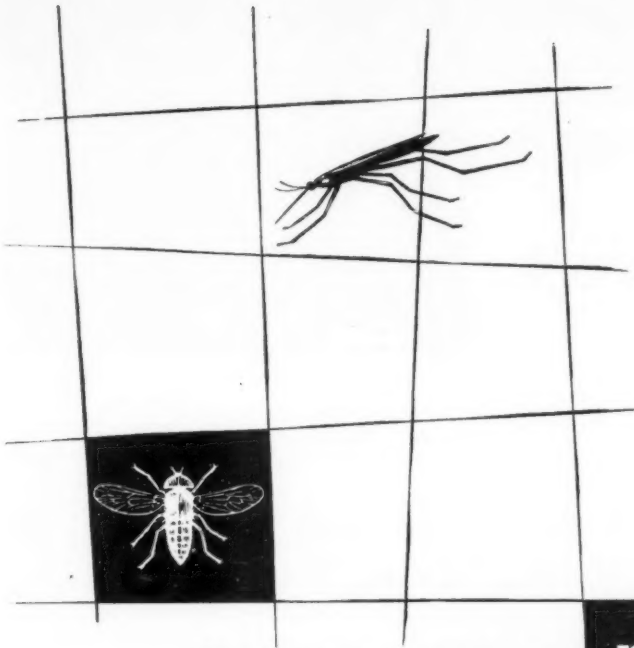
Here are some examples of the general preventive recommendations commonly required: (1) Take all precautions to avoid entry of pests, through transport or by other means, into the plant with incoming materials; (2) As nearly as possible, exclude by pest proofing and by attention to control in the vicinity, all entry of vermin from plant property; (3) Eliminate all unnecessary pest food and harborage in and about the plant; (4) Provide accessibility through and around all necessary storage of merchandise and equipment to permit inspection and extermination work, and (5) Maintain thorough clean-up of all pest leavings in the plant. All of these phases of a sanitation program indicate the measure of cooperation from management necessary to justify an investment in pest control.

Combine Control, Prevention

It should be distinctly under-

(Continued on page 34)

"Johnson's wandering about in a fog again!"



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Stored Grain Pests Cause $300 Million Damage Annually

By J. Harvey Sturgeon

Sturgeon Pest Control, Louisville, Kentucky

Rats attacked these grain bags left on warehouse floor.

An expose of common breeding places for those pests most responsible for this threatening condition.

HISTORY TELLS US insects were found in supplies of grain taken from an Egyptian tomb. In ancient times, insects lived in the open, feeding on seeds of many wild plants, as well as food crops of both man and beast.

There is a continuing war between humanity and insect pests. Since the world began, we have yet to exterminate a single insect species.

It is interesting to note that estimated damage caused by stored grain and food pests in the United States alone is well over $300,000,000 annually. In addition, insects in this country continually nullify the labor of one million men.

To further emphasize the importance of these principles, the presence of one or two insects in a bin of grain is likely to be looked upon with indifference. In 1948, H. E. Gray calculated that one pair of confused flour beetles was theoretically capable of producing over 1,000,000 individuals in 150 days, a period of five months.

According to Dr. R. T. Cotton, weevils and many bran beetles will devour more than their own weight in food each week. Their larvae will destroy many times their own weight in food during the 3 or 4 week course of their development. Few farmers take the trouble to weigh their grain when it is put in storage. When it is sold, they have no idea of the quantity lost through insect feeding. Those who do weigh their grain are often astounded at the shrinkage. It is not uncommon for a farmer to discover a 10 per cent reduction in wheat during one storage season, caused by insect damage.

Field Infestations

When grain is ripe it should be harvested because grain left standing in the field after it has ripened or left in the shock for many days after harvest, is often invaded by grain insects that come from nearby infested areas. Many grain insects are very strong fliers and are sometimes helped by the winds to reach these ripe grain fields where they lay their eggs which infest the grain. When the new crop is put in storage, with the proper humidity and temperature present, the eggs hatch a second generation within four to six weeks. Referring to Dr. Gray's findings of the accumulation of over 1,000,000 individuals in only 150 days from one pair of confused flour beetles, you can visualize the tremendous infestation to be reached in a short time.

Kansas Loss 5 Million Bushels

From July to November, 1947, in Kansas, the average insect population of untreated wheat in farm storage increased from 40.8 insects per 1,000 grams (about 1 quart) in July to 129.1 per 1.000 grams in October. More than 100 million bushels of wheat were in farm storage in Kansas during that period, and a simple calculation shows that the total insect population of that wheat in October exceeded 350 *billions*. Placing these insects end to end in twelve rows, they would reach from Indiana to Los Angeles, to San Francisco, to Grand Canyon and back to Indiana. These insects destroyed between 1 and 2 per cent of the wheat per month during the period July to November. A tremendous monetary loss resulted. Conservative estimates of this loss in 1947 of wheat stored on farms in Kansas alone would thus be 5,000,000 bushels. Multiply the loss in Kansas by the grain yield of the nation. It shows how important these insects are to our economy.

"Why More Insects Now?"

Calling on the trade around the country, the most common question I encounter is "Why do we have more insects today than when my father operated this plant?" The answer is obvious. If we go back to World War I when grain products were transported from foreign countries, we would find that the Indian meal moth was brought from India, the lesser grain borer from Australia, the Angoumois grain moth from France, the Mediterranean flour moth from the area around the Mediterranean. These are examples of a few. Add the fact that we once depended on oceans, deserts, and mountain ranges to serve as natural barriers to insect spread. With our modern transportation systems, these are no longer considered effective. If infested grain is shipped in a railroad car and if that car is not cleaned and properly treated before it is reloaded with grain, it contaminates the fresh load and

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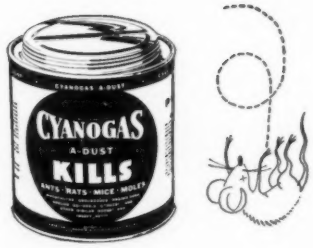

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begins an endless chain of infestation.

Here are other reasons for increased numbers of stored grain pests: Our country's population has increased by many millions since World War I; grain demands on the farmer increase year after year; manufacturers are constantly increasing their facilities for greater production; mill and cereal products are more varied in size and formulation; inventories are larger and transportation systems are loaded to capacity.

Insect-Caused Hot Spots

When grain in storage is infested, it often suffers considerable damage from heating that may be caused by the activities of insects. When insects become active in large numbers, their body temperature rises creating both heat and moisture which is absorbed by the surrounding grain. This results in "hot spots". Grain men sometimes refer to it as "bin burn". Because of this environment, insects can breed and multiply no matter how cold the climate.

Moisture plays an important part in the breeding of insects. Heavy rainfall during harvest season usually brings high moisture grain to the storage bin which is favorable for bran beetle development. Increased populations result.

Watch For Poor Housekeeping

The most important cause of insect infestation is unsanitary housekeeping. In many instances, I have seen broken packages, soiled bags, and infested materials returned from dealers to the plant. Of course, these products should be disposed of at once, but often they are piled in heaps and left for long periods of time, where they become sources of infestation.

Spillage from broken bags on wall supports, shelves, and floors, accumulate insects rapidly. Often we find unused equipment that has not been cleaned since it was in operation. This constitutes harborages for pests.

In normal operations of grain food processing, food dust is often spread over machinery, shelving, ledges, and finds its way into floor cracks. Insects are attracted to these places and their population thrives. Used bags always contain small bits of food and are another source of contamination.

Storage bins not properly cleaned between turnings of the grain afford a harborage for insects particularly in wooden bins where there are many cracks and crevices where grain accumulates. Likewise, grain handling equipment where grain accumulates in dead end spaces, unless properly cared for, will infest new crops passing through machinery.

Screenings are often stacked in the granary or nearby buildings and left until sufficient amounts for disposal are accumulated. During this period, many insects emerge from screenings and spread throughout the plant.

Operator here is fumigating corn in steel storage bins. He's using a power sprayer which delivers about seven gallons of fumigant per minute.

In many of the food processing plants, tremendous infestations are found coming into the plant through repeated shipments in railroad cars and trucks. Each incoming shipment in a vehicle so contaminated would be infested. Railroad sidings are another source of trouble. Too often we find grain doors used in railroad cars scattered along the siding and these afford harborages not only for insects, but for rats and mice feeding on the spillage.

When old grain buildings are remodeled for other uses, there is usually an accumulation of grain left between the floor, ceiling and wall void spaces. In many instances, grain insects will emerge from these undisturbed accumulations and contaminate new products. Mr. Charles Denny, St. Louis, Missouri, tells of his experience when a grocery occupied a remodeled grain storage building. Grain insects were attacking cereal products. Investigation revealed the source of this heavy infestation to be a space between the ceiling and second floor where grain had accumulated over a long period of time. The insects were dropping from the ceiling into the store.

Stored grain or its products are infested by several hundred species of insects. Fortunately, only a few of these are seriously destructive. Of these, we will discuss the four main groups, namely: weevils, bran beetles, moths, and mites.

Rice Weevil

Worldwide in its destruction, it is supposedly a native of India. It was rare in North America in colonial times but today has become one of the most important grain pests in our country. Rice weevils feed on wheat, corn, and other grains. Hinds reported that in central Alabama, one-half of the corn stored on the farm before April 1st and all of it after that time, decreased in value about ten per cent each month of storage, owing to the attack of this weevil. It is estimated that the rice weevil costs the grain trade in the United States more than $60,000,000 annually.

Granary Weevil

Second in importance to the rice weevil as a pest of stored grain, it prefers a temperate climate and is most frequently found in the Northern States. Not found in the open field.

Angoumois Grain Moth

This insect was so named because of its destructive work in the province of Angoumois, France in 1736. It is the most damaging grain *moth* in this country, feeding on wheat, corn, and other whole grain. Being cosmopolitan in distribution, it is found in the south, east, and central states. The Angoumois grain moth is a strong flier and often

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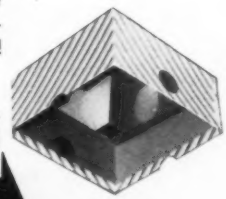

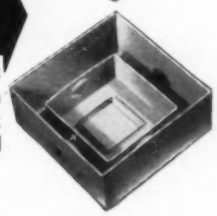

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infests ripening grain before harvest.

Mediterranean Flour Moth

Most important because of the trouble it causes in flour mills, its webbing clogs machinery and often mills must be shut down while machinery is thoroughly cleaned. This insect was found in Canada in 1889 but today has spread throughout the United States and most of the world. Its favorite food is flour but it will attack other milled products.

Indian Meal Moth

First discovered feeding on corn meal, this moth generally infests cereal products, breakfast foods, nuts, and dried fruits, although it prefers coarsely ground flour and mill products.

I once met a woman who thought that Indian meal moths were destroying the clothing in her home. As I approached the house, I could see Indian meal moths resting on the front screen door. I immediately asked to see her popcorn. She was so excited, she could not believe the moth was eating anything but her clothing. When a lid from a basket of popcorn was removed, the moths swarmed out in large numbers. Practically each kernel of every ear was perforated.

During the past year, we also came in contact with Indian meal moths infesting navy beans. Their webs completely covered the bags and infestation was tremendous.

Lesser Grain Borer

One of the smallest beetles injurious to grain in our country. Despite its size, it presents a serious problem because of rapid spread. The lesser grain borer was first noted in a shipment of seeds and roots from India, in 1792, and was introduced into the United States about 100 years ago. It became more prominent during World War I in shipments of grain from Australia. This beetle has been known to attack the finished flour product as well as stored grain. Wheat kernels have been reduced to mere shells by their feeding. Owing to the size of this insect, it can easily conceal itself in products where its presence may be unknown, making it extremely simple to transport from one location to another.

Cadelle

The Cadelle is one of the best known stored grain insect pests in the United States. Unfortunately it has a habit of burrowing into the woodwork of a grain bin to pupate and even a seemingly well cleaned bin may harbor thousands. Woodwork of railroad cars used to transport grain is sometimes riddled with burrows and even after the cadelle has been eliminated, other grain insects use these channels as harborages. Cadelles generally feed on stored grains or seeds. Because it has a habit of cutting holes in flour sacks and silk cloth used in machinery, it is sometimes referred to as the "bolting cloth beetle".

Bran Bugs

This group comprises a number of species. Three of the most common are the confused flour beetle, saw-toothed grain beetle, and the red flour beetle, most important pests of granaries, elevators and flour mills in the United States. Together they probably constitute more than 80 per cent of the insect population in flour mills. These insects are easily introduced because, coming in with the grain, a few will pass through the first break rolls uninjured, through the top screen of the first break sifter and into the purifiers. Elevator heads and boots are likely to be infested with bran bugs. In warehouses, these insects are found on bags of food and feed products, in between the bags and concealed in the flaps and seams where the bags are sewed.

Cigarette Beetle

Also known as the tobacco beetle, this is the most costly insect pest of tobacco and also causes considerable damage to upholstered furniture, feeding on fillers such as tow, moss, and others. It infests dried plant products and occasionally even grain and cereal products. This beetle is found throughout the United States and Southern Canada.

The destructive larder beetle feeds on nearly all kinds of meat products, on ham, bacon, dried beef, as well as on feathers, hides and hair. It is often found around meat cases, cracks in floors, etc.

Flour Or Grain Mite

Microscopic in size, the flour or grain mite infests grain, milled, and cereal products and is considered the most injurious species of *mite* to grain products in North America. The presence of these mites on products indicate it is high in moisture content or going out of condition. Fortunately, these grain attacking mites are preyed upon by an abundance of predaceous insects whose number is large enough to kill the grain mite in a comparatively short time. In spite of this, they sometimes become a serious pest problem.

Cheese Mite

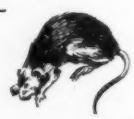
So minute it can hardly be seen by the naked eye the cheese mite infests all kinds of food products. It creates a problem by its ability to survive a number of months without food. The cheese mite occasionally causes a skin irritation to humans where one handles infested food products. This pest inhabits meat and cheese counters of grocery stores, dairies, and packing houses. It often infests the lining of cream and cheese vats as the cork insulation is high in moisture content.

The field supplies the farmer, the farmer sells to the processor, the processor to the distributor, the distributor to his dealer.

He in turn sells it back to the farmer, and the merry-go-round goes round and round. In every step of this process precautions must be taken to avoid destruction and contamination by grain insects.

From a paper given at the 1952 Purdue Conference, Jan. 28-Feb. 1 in Lafayette, Ind.

What's Wrong With Chicago's Rat Control Program?



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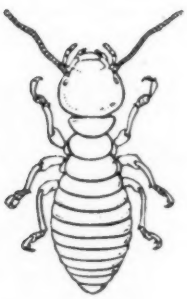

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Control of:

Little Black
Pharaoh and
Argentine

ANTS

Results of field tests conducted with newer insecticides on these three species in infested houses by

Hamilton Laudani and
H. T. Vanderford

**Entomologists,
Bureau Of Entomology & Plant Quarantine
U. S. Dept. of Agriculture**

A SERIES of practical tests on the control of three species of ants infesting houses was conducted in Savannah, Ga., during the summer of 1950. The object of these tests was to determine the effectiveness of the following insecticides: 2-per cent chlordane, 0.5-per cent lindane, 5-per cent DDT, 0.1-per cent pyrethrins plus 1-per cent piperonyl butoxide, and 0.1-per cent allethrin plus 1-per cent piperonyl butoxide.

The three species of ants selected for these tests were the Argentine ant *(Iridomyrmex humilis* Mayr.), the little black ant, *(Monomorium minimum* Buckl.), and the Pharaoh ant *(M. pharaonis* (L)). These three species were selected because they are the most troublesome ones in this region.

The method of treatment used for each was based on its habits. The Argentine ant, being a ground-nesting species, uses the exterior of a building and any objects bridging from the ground to the building to gain entrance into a house. Therefore, the treatment used on all houses infested with the Argentine ant consisted of spraying the exterior of the building from the ground to the first-floor-window level, the window and door frames, steps, periphery of porches, and, whenever possible, the underside of the houses, making certain that pillars, pipes, and other objects forming a bridge from the ground to the house were thoroughly treated.

The little black ant in the Southeast nests in cracks in the foundations, steps, and porches; in rotted building timbers; and in the ground in rotted stumps and under rocks, bricks, and cement slabs. To cover all possible surfaces used by this ant, it was found advisable to treat the exterior of the building, as described for the Argentine ant, and also to make an inside treatment covering the baseboards, door and window casings, and areas around sinks and bathtubs.

The Pharaoh ant nests in the foundations, and in wall, floor, and ceiling spaces, in folds of stored linen, open food packages, and many other places inaccessible for treatment. Because this ant nests practically anywhere in a building, it is the most difficult species to control, and therefore a thorough treatment is required to control it. In addition to using the same type of treatment as described for the little black ant, the ceiling moldings, wall cabinets, and shelves were also treated in houses infested with the Pharaoh.

All houses used in these tests had partial foundations, and none had full basements.

Emulsion sprays were applied to the exterior of buildings with a 3-gallon compressed-air sprayer, using 30-pounds pressure and a size-.8002 fan-type nozzle. Oil solutions were applied in the interior of the buildings with a 1-quart sprayer that had a size-.8001 solid-stream-type nozzle. The emulsions were selected for exterior spraying because this type of formulation does not injure plant foliage when used carefully. Oil solutions were used for interior spraying because they have less tendency to spot surfaces than do emulsions.

A minimum of three houses was treated with each insecticide for each species of ant. When the first treatment was no longer effective, two follow-up treatments with the same insecticide were applied when possible. If control was not obtained after the third treatment, the premises were sprayed with 2-per cent chlordane, since chlordane was already known to be very effective against ants.

Observations were made at weekly intervals and control was considered at an end when ants were observed on the treated surfaces. All treatments undoubtedly caused some mortality, but those which did not remain effective for 1 week were considered in these tests as giving no control. The tests were brought to a close in November, when the low outside temperatures affected the behavior of the ants.

Results

As shown in Table 1, page 20, chlordane gave the best control of Argentine ants. Complete control for the season was obtained with chlordane in two of the three houses treated, and the third treatment lasted 17 weeks. Individual treatments with lindane kept the houses free of Argentine ants from 3 to 7 weeks on the interior of the buildings and 1 to 7 weeks on the exterior. Three repeated treatments failed to control the ants for the season. Two of the houses sprayed with DDT were protected for less than 1 week, but the treatment of one house lasted 15 weeks on the interior and 14 on the exterior. The protection given by pyrethrum or allethrin in combination with piperonyl butoxide was of

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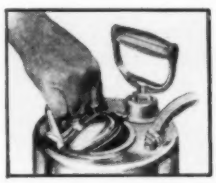

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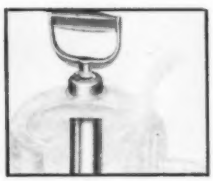

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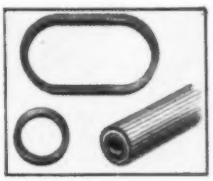

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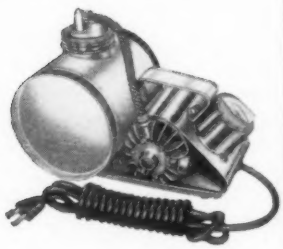

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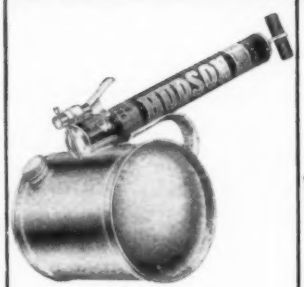

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Table 1 — Results of spraying houses with various insecticides for control of the Argentine ant.

Insecticide	House No.	Weeks effective after each treatment							
		First		Second		Third		Follow-up with 2% Chlordane	
		Interior	Exterior	Interior	Exterior	Interior	Exterior	Interior	Exterior
Chlordane 2%	35	19*	19*	—	—	—	—	—	—
	39	19*	19*	—	—	—	—	—	—
	44	17	17	—	—	—	—	—	—
Lindane 0.5%	33	3	2	3	2	7	7	5*	5*
	40	3	1	3	3	6	5	4	4*
	42	3	1	—	—	—	—	—	—
DDT 5%	32	0	0	—	—	—	—	—	—
	37	0	0	—	—	—	—	—	—
	43	15	14	—	—	—	—	2*	2*
Pyrethrins 0.1% plus piperonyl butoxide 1%	38	0	0	2	0	4	2	5*	5*
	46	3	0	0	0	1	0	—	—
	34	2	1	0	0	0	0	9*	9*
Allethrin 0.1% plus piperonyl butoxide 1%	36	—	0	—	0	1	0	9*	9*
	41	0	0	0	0	2	0	9*	9*
	45	3	0	2	1	1	0	8*	8*

*Still effective at last observation

Table 2 — Results of spraying houses with various insecticides for control of the little black ant.

Insecticide	House No.	Weeks effective after each treatment							
		First		Second		Third		Follow-up with 2% Chlordane	
		Interior	Exterior	Interior	Exterior	Interior	Exterior	Interior	Exterior
Chlordane 2%	13	22*	22*	—	—	—	—	—	—
	23	15*	15*	—	—	—	—	—	—
	5	17	5	4*	4*	—	—	—	—
Lindane 0.5%	7	0	0	0	0	2	0	10*	10*
	22	7	7	—	—	—	—	—	—
	12	3	1	2	1	3	1	9*	9*
DDT 5%	6	0	0	0	0	—	—	—	—
	11	0	0	0	1	3	0	10*	10*
	21	2	2	1	2	2	2	10*	10*
Pyrethrins 0.1% plus piperonyl butoxide 1%	9	0	0	0	0	—	—	14*	14*
	24	0	0	0	0	0	0	5*	5*
	14	0	0	0	1	0	0	10*	10*
Allethrin 0.1% plus piperonyl butoxide 1%	10	0	0	0	0	—	—	14*	14*
	25	0	0	—	—	—	—	—	—
	15	0	0	0	0	0	0	12*	12*

*Still effective at last observation

Table 3 — Results of spraying houses with various insecticides for control of the Pharaoh ant.

Insecticide	House No.	Weeks effective after each treatment							
		First		Second		Third		Follow-up with 2% Chlordane	
		Interior	Exterior	Interior	Exterior	Interior	Exterior	Interior	Exterior
Chlordane 2%	8	22*	22*	—	—	—	—	—	—
	47	18*	18*	—	—	—	—	—	—
	49	16*	16*	—	—	—	—	—	—
	31	5	12	7*	7*	—	—	—	—
	20	8	9	9*	9*	—	—	—	—
Lindane 0.5%	1	6	2	1	2	1	2	9*	9*
	16	3	6	2	4	7	9	—	—
	29	3	4	—	—	—	—	—	—
DDT 5%	27	0	0	0	3	0	3	10*	10*
	2	0	0	0	0	0	0	12*	12*
	18	0	0	0	2	0	0	10*	10*
Pyrethrins 0.1% plus piperonyl butoxide 1%	4	0	0	0	0	0	0	12*	12*
	30	0	0	0	3	0	3	12*	12*
	19	0	0	2	0	0	0	10*	10*
Allethrin 0.1% plus piperonyl butoxide 1%	28	0	0	0	0	0	0	9*	9*
	3	0	0	0	0	0	1	12*	12*
	17	0	2	0	0	0	0	6*	6*

*Still effective at last observation

very short duration. Three repeated applications failed to give protection for more than 6 weeks. After the third treatment with pyrethrum or allethrin, the houses were sprayed with 2-per cent chlordane, and all were protected for the remainder of the active season (5 to 9 weeks).

The results obtained on the control of little black ants are shown in Table 2. Again chlordane gave the best results, with two out of three treatments lasting the remainder of the season and the third lasting 17 weeks on the inside and 5 weeks on the outside of the houses. The maximum protection obtained with lindane was 7 weeks and with DDT 3 weeks. Pyrethrum and allethrin failed in all tests to give 1 week of protection indoors. Repeated applications of lindane, DDT, pyrethrum, and allethrin failed to control the infestation of little black ants for the season. After three treatments with each of these insecticides, the houses were sprayed with chlordane. In all tests the chlordane treatment controlled the infestations for the remainder of the season (5 to 14 weeks).

In the control of the Pharaoh ant (Table 3), complete seasonal protection was obtained with a single treatment of chlordane in three houses, and with two treatments in the other two houses treated with this material. Lindane afforded protection for 1 to 7 weeks indoors and 2 to 9 weeks outdoors. However, three successive applications failed to give a season's protection. DDT, pyrethrum, and allethrin gave little or no control. Chlordane as a follow-up treatment controlled the Pharaoh ant for the remainder of the season (6 to 12 weeks) in all houses where three successive applications of lindane, DDT, pyrethrum, and allethrin had failed.

Pertinent Observations Regarding Formulation

Emulsions

Emulsions were found to have advantages over the other types of formulations. An insecticide in emulsifiable concentrate form could be transported in a relatively small container and diluted with water on location, thus cutting to a minimum the bulk of ma-

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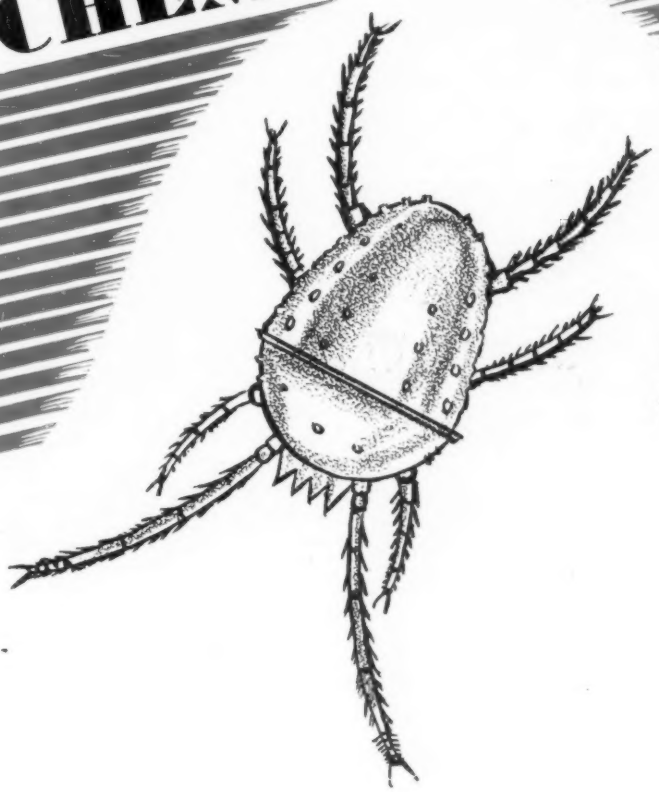

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terial necessary for transportation. It was observed that most surfaces treated with emulsions were less repellent to ants than those treated with oil solutions. This naturally meant that more ants came in contact with the material and, consequently, a higher mortality was obtained. A low concentration can be used where vegetation is present without causing serious injury to the plants. The disadvantage of emulsions is that they tend to stain certain surfaces and materials.

Oil Solutions

Oil solutions tend to repel ants, and therefore can be used to advantage where the immediate elimination of the ants is desired. Oil solutions generally cause less staining and spotting than any of the other formulations. Oil solutions damage asphalt and certain other composition floorings; therefore precautions should be taken against this type of damage.

Wettable Powders

Wettable powders are the formulations least toxic to plants; however, they leave a noticeable residue and should not be used where such a deposit is objectionable. Another disadvantage of wettable powders is that the material must be kept in constant agitation while spraying is being done. Nozzle clogging is common when wettable powders are being used. Because of these objections wettable powders were not employed in the tests described in this article.

Dusts

Although dusts were not included in these tests, they can be used to advantatge in treating inaccessible places, such as the undersides of buildings having partial foundations, and in floor and wall spaces. The objection to dusts, especially when used indoors, is that they are usually unsightly.

Rats Gnaw Off Child's Fingers

A three months old Abilene, Texas child had her fingers gnawed off by rats when left alone in an apartment recently. Later inspection showed large numbers of rats roaming in the basement.

The maimed child will survive.

A STUDY OF TOXICITY AND EFFECTIVENESS:

The Facts on Methoxychlor

Methoxychlor, an insecticide, is the methoxy analog of DDT. When first tested under laboratory conditions in 1942, it showed low toxicity to warm-blooded animals and sensitive plants. Field usage has confirmed these findings.

Toxicity Tests

Studies of the acute oral and chronic toxicity of methoxychlor on warm-blooded animals were conducted by the Haskell Laboratory of Industrial Toxicology at the E. I. DuPont Co. in Wilmington, Del. In the acute oral test series, methoxychlor proved less than 1/24 as toxic to warm-blooded animals as DDT. "Symptoms from a single acute dose of methoxychlor may not appear," the report states, "since it is rather doubtful whether an individual could swallow enough to cause poisoning. . . The fatal dose for man is estimated to be about a pound if ingested at one time."

To determine chronic toxicity, cattle were fed and anointed with methyxchlor. These animals showed little or no storage of the compound in their body fat. Another group of cattle, tested in the same manner with DDT, showed a considerable amount of insecticide storage. These facts were supported by similar studies on other animals.

In 1949, the U. S. Department of Agriculture approved the use of methoxychlor as safe to use on dairy cows and slaughter animals. Although several insecticides are known to penetrate the skin and appear in the milk of animals, methoxychlor does not present this hazard. USDA says that young calves are not harmed by a single application of as high as 8% methoxychlor.

Where Is It Useful?

This compound is effective against many types of livestock insects. However, it will not control hog mange or ticks, and does not eliminate deer or horse flies, though it appears to repel these latter insects for several days.

Methoxychlor gives good control of horn flies on cattle. A 0.5% wettable powder spray, applied two quarts per mature animal, has given anywhere from 3 to 7 weeks protection, depending on geographic location and climate. In this instance, residual action is about as long as for DDT.

Complete kill of short-nosed ox louse was obtained on a herd of 72 steers with 0.4% methoxychlor applied through a high pressure sprayer. Hair on cattle was found to be insecticidal to lice for 20 days, longer than the known egg incubation period.

DuPont scientists have this to say in summary of methoxychlor's effectiveness against stable flies: "It is very good as a residual spray for stable flies on surfaces where flies remain for a long time. Methoxychlor will do as much to control stable flies as any other residual insecticide known." USDA reports that in cage tests, "a wettable powder spray containing 0.5% methoxychlor applied to cattle prevented feeding of stable flies for several days, and killed most of the flies which took blood during the first week after treatment. DDT also killed flies which took blood, but did not prevent feeding."

Normal residual action for this chemical when used as a 0.5% spray on cattle is about three weeks. If the animals are isolated from each other, additional spraying may not be needed for 60 days. Protection for two or three months can be obtained by spraying barns and premises with 2 to 2½% methoxychlor.

Methoxychlor has proved safe on many highly sensitive plants, and residual effectiveness against certain crop insects is said to exceed that of rotenone and approaches that of DDT. Its low toxicity makes it useful where residue hazards might be involved with use of more toxic insecticides.

Abstracted from the Story of Methoxychlor by C. J. Krister of E. I. duPont deNemours & Co. The article first appeared in the July, 1951 issue of **Agricultural Chemicals**, and was reprinted in condensed form in the **Agricultural News Letter** (Vol. 19, No. 6), a duPont house publication.

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"SERVING THE PEST CONTROL INDUSTRY"

pyrethrins + SULFOXIDE .. for food plant insect control

by Patrick J. Connolly
S. B. Penick & Co.

REGULATORY agencies are giving greater attention to the safe use of insecticides and rodenticides being applied in those establishments in which food is processed, stored, packed, or handled. Therefore, the pest control operator must give more attention to the selection of non-hazardous or non-toxic materials, bearing in mind the necessity for keeping the premises insect-free and rodent-free. Many pest control operators are already recognizing this trend and are now making wider use of the relatively non-toxic materials.

Newest material to be made available to the pest control operator for such use contains pyrethrins and the synergist, Sulfoxide. The merits of pyrethrins have been long recognized but their relatively high cost and lack of residual effect have limited their use. These limitations have been overcome to some extent through the use of synergists. The synergist, Sulfoxide, tends to stabilize pyrethrins, therefore extending their residual activity. It also increases the insecticidal efficiency and reduces cost.

Use Wherever Pyrethrum Permitted

Sulfoxide has the chemical name n-octyl sulfoxide of isosafrole. It can be formulated with pyrethrins in oil solutions, emulsifiable concentrates, wettable powders, and dusts. It has insecticidal properties of its own but it is best used in combination with pyrethrins, allethrin, rotenone and Ryania. It is non-irritating and has a pleasantly mild odor. Being of the same low order of toxicity as pyrethrins, it can be used wherever pyrethrum sprays are currently permitted.

The United States Department of Agriculture has approved the use of Sulfoxide with pyrethrins for the elimination of roaches, flies and other insects in places where exposed meat is handled in federally inspected meat-packing establishments. They require, however, that exposed meat be first removed and that the premises be cleaned thoroughly after completion of the spraying operation. These restrictions do not apply, however, to other rooms in meat-packing establishments where exposed meats are not handled.

Probably the PCO will find widest use for the Sulfoxide-Pyrexcel 20 which contains .62% pyrethrins and 4.98% Sulfoxide. When used as a space spray in the standard compressed air equipment for the control of flies, mosquitoes and gnats, it is mixed with deodorized kerosene at the rate of 1 plus 19. If an electric sprayer is used, then it is diluted at the rate of 1 plus 2.

Control Grain Moths

This same dilution in the electric sprayer will do an excellent job in controlling the Indian meal moth and the Mediterranean flour moth around stored grain. It is applied at the rate of approximately 6 ounces per 1000 cubic feet of space above the stored grain. This will give good control of the adults above the grain and will to some extent combat surface infestation.

For residual control of grain insects, the Emulsifiable Sulfoxide-Pyrexcel 1-10 is recommended. This contains 1% pyrethrins and 10% Sulfoxide. It is diluted with 9 parts by volume of water, and applied to the cracks, crevices, and joints in the ceiling, walls and floors of the storage bins and other storage areas. This particular spray can be used to good effect for treating box cars and trucks which are used in transporting grains and flour. Application should be made at the rate of about 2 gallons per 1000 square feet of surface area with a coarse wet spray.

For roach control the Sulfoxide-Pyrexcel 20 is used diluted at the rate of 1 plus 9 with deodorized kerosene. Repeated applications will be required in order to obtain complete control. However, if it is diluted at the rate of 1 plus 4, it will give limited residual control.

It should be noted that the pyrethrins-Sulfoxide combination can be applied for residual control. However, there are many factors limiting the feasibility of such applications. The pyrethrins break down on exposure to strong light and a residual application should not be attempted under this condition. Applications of highly concentrated materials are expensive and generally not warranted except for special problems. If the concentration is sufficiently high and is applied to unexposed surfaces, then a good residual effect can be expected.

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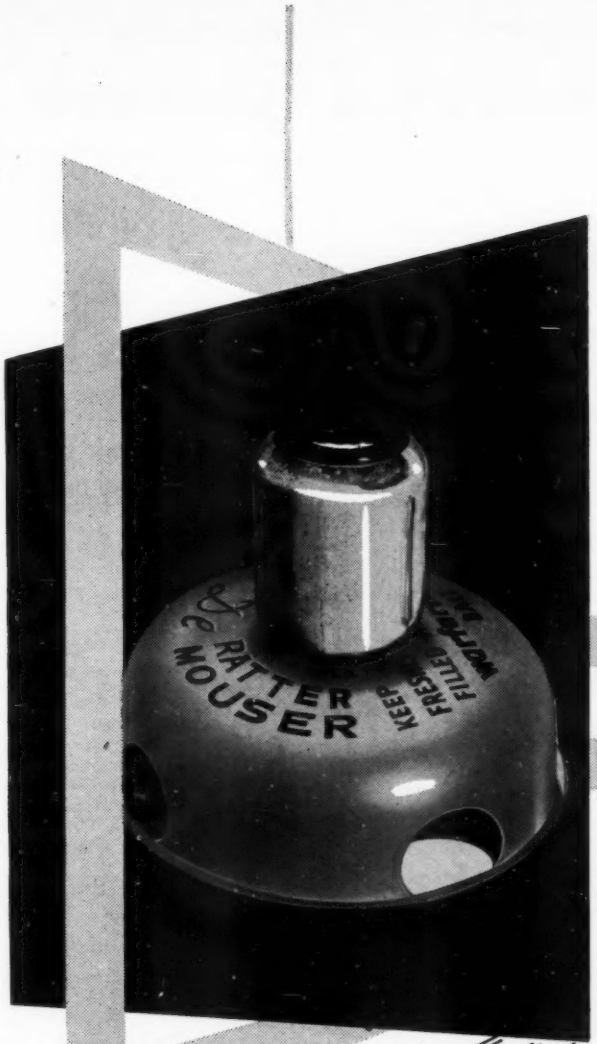

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Insecticide Program To Be Best Yet

At C. S. M. A. June Meeting In Boston

Authors of two books, a symposium on industrial uses of insecticides and another on chemical vaporizers are only part of the Insecticide Division's program planned for the Chemical Specialties Manufacturers Association 38th Mid-Year meeting, to be held in Boston's Sheraton Plaza Hotel, June 8-10.

Dr. H. W. Hamilton

James A. Green, Standard Oil Co. of Indiana, chairman of the insecticide group, and his committee say their session promises to be one of the most informative they've ever held. This is just one of the six divisions holding concurrent sessions during the three-day meeting which begins with registration on Sunday, June 8. There are other divisions on aerosols, disinfectants and sanitizers, soaps and detergents, waxes and floor finishes, and the newly formed automotive chemicals section.

All meetings are open to anyone upon payment of the $30.00 registration fee which includes two luncheons, a special reception, and the banquet-floor show, according to Dr. H. W. Hamilton, C.S.M.A. managing director.

Brown and West Speak

A. W. A. Brown, head of the department of zoology, University of Western Ontario, London, Canada, and author of "Insect Control by Chemicals" will open Monday's insecticide forum by enlarging on the subject covered in his book published late last year.

"The Housefly" is the title given by Luther S. West to his book which came out in 1951. Mr. West, who is head of the department of biology at Northern Michigan College of Education, is to discuss those parts of his work which concern control of this pest by insecticides.

Industrial uses of insecticides, a symposium headed by Dr. Alfred Weed of John Powell & Co., is to include such uses of pesticides as in (1) fabrics, explained by Dr. George R. Ferguson, Geigy & Co., (2) dairies, by R. T. Orr, Diversey Corp., (3) packing plants, by W. Schwab, Armour & Co., and in (4) food storage places, which are to be explained by one or two speakers yet to be announced.

One of the highlights is the first announcement of conclusions resulting from a long study made by the Gulf Research and Development Company. No further details can be given before the program, but this paper may have significant bearing on the development of future pesticides.

Head of the U. S. Public Health Service's Communicable Disease Center in Atlanta, Ga., Justin Andrews, opens Tuesday's insecticide section by giving an analysis of the importance of insecticides in the protection of public health.

Tackle Vaporizers

One of the most controversial subjects of the day, insect control by chemical vaporizers, has been handed to a symposium headed by E. J. Campay, Standard Oil Co. of Indiana. Dr. R. H. Fulton, Agricultural Research Administration, U. S. Department of Agriculture, Beltsville, Md., is to cover their chemistry and entomological effectiveness. Lindane, one of the principal ingredients in most vaporizers, will be discussed by T. Walter Reed of California Spray-Chemical Corp., Haddonfield, N. J., and Dr. George R. Ferguson, Geigy & Co., New York City, will conclude with a statement on DDT and its relation to these devices.

A basic study on fundamental

(Continued on page 54)

PEST CONTROL

primer

by A. Pescop

Identification Of Orders; No. 9, Diptera

Part II

Dip (two), **pteron** (a wing)

Mosquitoes

General characteristics of this order may be found on page 38 of the April issue.

Mosquitoes (family Culicidae): There are some 140 recorded species of mosquito in North America alone. All mosquitoes have mouthparts consisting of six bristle-like organs in a sheath. Lancets pierce skin and blood is then sucked up and toxin pumped in, causing swelling. Only females can bite. Males feed on nectar and plant juices. Below are three typical types of mosquito important to PCOs living in the United States:

1. *(Culex pipiens):* Adult approximately ½ to ¾ inches long. Pale brown with whitish bands across abdomen. Often called "common house mosquito". Breeds wherever stagnant water can be found, in northern United States and Canada. Life cycle can be completed in 7 to 10 days. Carries parasitic worms harmful to man. 5% DDT spray in an oil base will control mosquitoes inside the home. Outdoor residual control can be established with 50% DDT wettable powder. For immediate outdoor kill, an oil-water concentrate emulsion with 0.9% pyrethrins will do the job. Proper drainage of breeding areas is important. Space spraying by airplane, using a mixture of pyrethrins and DDT is a suitable method for covering wide areas.

2. *(Aedes aegypti):* About same size as *Culex*. Easily recognized by the silver-colored lyre on its thorax and silver stripes on abdomen and legs. Breeds in stagnant water in and about dwellings in urban areas in southern U. S. Transmits yellow-fever germ. Bites chiefly in early morning and later afternoon. Since *Aedes* larvae are surface feeders, larvicides dispersed on breeding areas are more effective. An interesting method of using dieldrin as a larvicide, scattering the insecticide in betonite capsules from an airplane, is more fully discussed in the September, 1951, issue of *Pest Control*, page 40.

3. *(Anopheles quadrimaculatus):* Size about same as other forms. Wing scales dark, without distinctive color. Palps unbanded and dark. Breeds in slow moving or stagnant water, particularly where green algae are found, in southern U. S. Transmits malaria. In biting position, body is in a position almost perpendicularly above inserted mouth parts, contrasting with *Culex* and *Aedes*, which keep their bodies in a more parallel position. Bites chiefly in morning and afternoon. Effective drainage of breeding areas is the best known control.

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A Section of PEST CONTROL magazine

TERMITES and other enemies of wood

Consultants: Dr. Thomas E. Snyder, Washington, D. C.; George L. Hockenyos, Springfield, Ill.; A. H. Bender, Washington, D. C.; R. B. Mesecher, Burbank, Calif.; J. Wiltred Gunn, Herbert R. Packard, Karl Hassler, Los Angeles, Calif.; Dr. Ira Hatfield, St. Louis, Mo.; Dr. E. H. Behr, Memphis, Tenn.; H. R. Isherwood, St. Louis, Mo.; J. L. Howell, Houston, Texas; Stanley L. Lind, Chicago, Ill.; W. K. Delaplane, Champaign, Ill.; Fred J. Bowers, Rahway, New Jersey. The information in this section does not necessarily reflect the opinion of these termite consultants and they will assume no responsibility for articles other than those which bear their names.

Distill Brain Food From Termites?

It's reported that scientists at the Graz Zoological Institute in Vienna have isolated a vitamin-like enzyme which is being called Vitamin T, in honor of the termite from which it is said to come. An item in a recent newspaper article says it has been administered to humans with remarkable results, with a decided tendency to "accelerate the functional capacity of the mind."

Your editors checked the authenticity of these facts with Dr. Thomas E. Snyder, world-known termite authority and editorial consultant to this magazine. He tells us that quite a bit of enzyme-extraction work on termites has been done in Europe, but it hasn't been substantiated yet by American scientists. European conclusions are that the new vitamin will, when administered to certain animals, increase food assimilation and lead to gigantism.

Dr. Snyder says that "some special foods do lead to the growth of four inch long African termite queens, and to the specialized, over-developed insect guests or termitophiles cared for by termites. These guests receive an exudate (honey dew) from the termite. In each instance, this is a post-adult growth, very unusual among insects."

Concludes Dr. Snyder: "If vitamin T could be made synthetically and fed to hogs and steers, what pork and beef we could produce."

Termites Empire Builders

Certain species of Isoptera in Africa and Australia build monumental mud spires often 20 feet high and 30 feet in diameter.

Precautions In The Use Of Oil Products With Termite Chemicals

by Alfred Zimmern

Consulting Engineer on Termite Control and Wood Preservation, Dallas, Texas

I was glad to see the article by Jerome L. Howell on the subject of "Safety is a part of every termite job, too!" in the January 1952 issue of Pest Control. In some of his suggestions Mr. Howell has not gone far enough as in the case of floor furnaces where the turning off of the pilot lights should have been mentioned as mandatory.

What Is "Flash Point"?

Some importance is given in that article to a term which in my opinion is generally and grossly misunderstood, namely the **Flash Point** of a flammable liquid, gas or certain solids. The general impression seems to be that if we use an oil solvent with a rather high flash point, there will be no fire hazard.

I first was impressed with this idea when reading the articles on the "Termites" page of the July and August, 1951 issues, where the writer of those articles spoke of ethylene dibromide diluted in a 350 deg. flash point kerosene (July issue), while he called it a 350 deg. flash point petroleum solvent in the August issue. A 350 degree flash point petroleum oil naturally does not belong in the kerosene class as kerosenes may have a gravity of 38 to 48 A.P.I. and a flash point (Tag Closed Cup Tester) of 120 to 180 deg. F.

The above mentioned article in the January issue speaks of "our duty—to keep our solvents in the 'safety flash point range'" and "we have checked our solution and found that it is not a fire hazard, so we can apply it with 'safety with reservations'." Then follows the warning "Do not apply if in direct contact with a flame, even if the flash point is in the safety range."

Oil Vapors Below Flash Point

Now, oil like any other volatile substance will evaporate, i. e. it will give off vapors at temperatures much below the flash point, but not in sufficient quantity and speed to present a flash hazard. Also, the flash point has scarcely any connection with how an oil behaves for instance in a burner or any other open flame, but there is a very decided relation of the flash point to safety in storage, namely, the lower the flash point the greater the possibility of a flash in storage tanks due to a spark or a flame. The small user like a termite operator really has no need to check the flash point of the oils he uses, which by the way takes some special laboratory equipment and delicate work, but he should obtain from his oil supplier the Flash Point value, as suggested in Mr. Howell's article, and then see that his drums of solvent oil are stored in a temperature well below the Flash Point. If the termite operator selects a cool storage space, he is generally on the safe side.

Using an oil solution in termite

control work, made with any petroleum oil as a carrier, means a flammable liquid in any man's language. Such a liquid will give off flammable vapors at practically any ordinary temperatures. Even if we do know the flash point of the oil solvent as supplied by our dealer, this value is changed somewhat when we add the chemical concentrate, which in nearly all cases has a different flash point value. Therefore, the safest rule to be followed by a termite operator is to consider any oil solution, no matter if it has a high or a low flash point, a fire hazard to a more or less degree.

While stored in drums or in a small tank, only a small part of the liquid, its top surface, is subject to evaporation. But when the chemical solution is being applied under a building, we meet an entirely new and different situation as now we spread out the chemical over a very large area of the soil, maybe also over a part of the sides of the foundation walls and even may spray on top of the foundation and parts of the foundation timbers. This means an enormous increase in the surface of the solution subject to evaporation into vapors and, not being enclosed in a drum or tank anymore, but out in the open, these large quantities of flammable vapors will mix freely with the air under the building. By volume, atmospheric air contains 21% of oxygen, 78.06% of nitrogen, 0.94% of argon and a trace of carbon dioxide (3 to 4/10,000 parts) and some water vapor. It is the oxygen in the air, that can do the dirty work, when there is a favorable condition for combining with the flammable oil vapors.

Under this entirely different situation of materially increased evaporation in the open air with no control over the air-vapors mixture taking place, other important factors enter the picture representing other properties of the oil solution which are now to be considered in addition to the flash point:

1) Fire point
2) Apparent ignition temperature
3) Explosion range
4) Vapor density with respect to air
5) Diffusion of the vapor in the air space

Fire Point Differs From Flash Point

For explanation, the Flash Point is the temperature of a flammable liquid at the time it gives off a quantity of vapor, which is sufficient, when mixed with air, to form an ignitable mixture, which will "flash" but will not continue to burn. Flash points of the kerosenes are determined by the Tag Closed Cup Tester. The Cleveland Open Cup Tester serves the same purpose for lubricating oils. These are the American Standard Testers. As compared with the Flash Point, at which temperature the vapors will "flash," but will not continue to burn, we have the Fire Point, which is the temperature at which combustion will continue after the vapors are ignited.

Apparent Ignition Temperature is the temperature needed to begin an oxidation fast enough to remain after the heating element is removed.

Explosive Range is interesting as it deals with the most definite limitations of the property of a flammable vapor, mixed with air, of being flammable, i. e. a chemical change joined by the development of heat and light. This is also known as combustion producing a flame, popularly termed a "fire." There is a very definite lower and upper limit. If the vapor particles, which are set afire, will not ignite others nearest them, then the mixture is too lean and is below the lower limit, and again, if the vapor particles are so close together, that they even exclude the oxygen which is needed for the process of combustion, then the mixture is said to be too rich. In neither case will the mixture burn. But the percentage by volume between the leanest and richest mixtures will burn and this represents the Explosive Range.

Vapor Density with respect to air means the ratio of the amount of flammable vapors present as compared to the amount of air present in the same volume of vapor-air mixture, the ratio value for the amount of air present being assumed to equal 1. There are available flammable vapor indicators with readings in the lower explosive range limit.

(Continued on page 32)

BORER LINES

By DR. THOMAS E. SNYDER
Consultant on Wood Boring Insects and Wood Preservation

Preventing Reinfestation By Wood-Borers After Fumigation

The most effective and quickest method of killing dry-wood termites and powder-post beetles infesting the woodwork of buildings is to tightly seal all cracks, doors, windows and vents and then fumigate with heavy dosages of lethal gases. Due to the poisonous nature of these gases only detached houses can be fumigated and this dangerous work should only be undertaken by an experienced operator. Such fumigation will not prevent reinfestation soon after completion of the work.

Use Good Residual Spray

By use of toxic liquid sprays on the exposed woodwork after fumigation, reinfestation can be prevented. Chemicals with lasting residual effect must be used. A combined fungicide and insecticide will give protection against both decay and wood-boring insects. A petroleum solvent having a high flash point (at least 150°F.) must be used to reduce any hazard from fire. The toxic liquid should be applied at the rate of one gallon per hundred square feet of surface. Care must be taken to avoid staining plaster or wall paper; it may be necessary to brush the liquid on the wood instead of spraying the surface. Chemicals having lasting odors should not be used. A copper compound combined with DDT in petroleum oil has given good residual protection as has a chlorinated phenol mixed with DDT. The additional expense involved in these combined methods of gassing and spraying is warranted by the protection gained in preventing reinfestation by insects as well as attack by wood-rotting fungi.

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Oil and Termite Chemicals
(from page 30)

Diffusion Of Vapor in the air means the vapor particles widely spread out or suspended in an airspace, large or small, and if they are sufficiently close together to allow spreading of a flame from particle to particle, but separated sufficiently to allow room between them for the oxygen needed for combustion, then we have an ideal situation, in the presence of some source of heat equal to the apparent ignition temperature, to start a most rapid combustion termed a Flash Fire.

Flash Dangers Increase With Application

Considering carefully the foregoing statements of facts should be sufficient warning to termite operators that, if petroleum oils falling within kerosene range are already considered dangerous as a possible fire hazard while in storage, this danger is materially increased when it is taken out of storage and, mixed with a toxic concentrate, is put through a process of application under a building under atmospheric conditions.

Naturally, every service man working with an oil solution should wear goggles, a respirator and synthetic rubber gloves —but how many will do it? These particular safety measures naturally are not for fire protection but they are a mandatory health measure.

This article was not written to instigate an opinion against the use of oil solutions. This would be more than foolish. We only have tried to point out what actually takes place when we use an oil solution and showing by technical facts that the "flash point" value alone does not rule the existence or non-existence of a fire hazard. The possible fire hazard is there, we put it there, so what are we going to do about it? Hundreds and hundreds of homes are treated that way and nothing happens. But there is always a "first time" for everything and should conditions be favorable for this "first time", it might cost some lives and loss of property.

Remedies

Since without question we put the possible fire hazard under the building during treating operations, it seems reasonable that the least we can do to protect the property of our customer as well as the lives of our workmen is to remove this hazard. The most simple procedure toward this end is the use of additional safety equipment in the form of specially designed exhaust units carrying the fumes and vapors from under the building to the outside from the time treating operations begin. If necessary, these exhaust units should be kept in operation for an additional day or so after the treating job is completed. I said "specially designed" as standard units, by their construction, may add to the fire hazard and may be just the cause that could start something.

Safety regulations also should be revised and brought up-to-date to cover modern building construction with its new appliances. Service men are not allowed to smoke under a building BUT we permit them to relight the pilot lights of floor furnaces right after they complete treating operations with vapors of the oil solution still filling the under area of a building to a more or less degree. This surely is "safety with plenty of reservations". There are also panel heaters installed in the walls. They have pilot lights. And there are the central heating

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systems. The vapors can reach these appliances through the walls or the floor. Another rule that is sometimes broken is that service men leave oil soaked rags lying around or leave them open on the truck. Such oil soaked waste is subject to "spontaneous combustion", which is the result of heat developed by chemical changes, causing a rapid oxidation of the oil, resulting in the waste to "fire". Such waste should be placed in steel boxes with a tightly fitted cover.

Pest Control In Food Plants

(from page 10)

stood that preventive and exterminating measures never replace one another, but must go hand in hand for overall success. It is our opinion that application of thorough preventive measures will noticeably reduce the cost of a pest control program which meets legal and consumer requirements. From a legal viewpoint alone, preventive measures are prerequisite to plant conformance with Sec. 402(a)(4) and product conformance with Sec. 402(a)(3) of the law.

We shall not attempt a complete breakdown of all functions embodied in each of the five points suggested above. However, we might sum up the qualifications necessary to the individual who may undertake planning and direction of pest control in food plants. He should know:

1. What the operating routine and problems of the industry and plant are.
2. The pest involved, (i. e., what it eats, where it harbors, its reproduction rate, different forms, favorable reproductive environment, etc.)
3. What stages are most destructive.
4. What stages have the greatest contaminating potential.
5. How it normally moves about or is inherent in the raw materials.
6. What constitutes pest leavings, aside from the pests themselves.
7. How these leavings can be thoroughly removed from plant surfaces.
8. What type of food and material storage is needed for control of a given pest.
9. What methods and materials can be effectively used for pest exclusion.
10. What inspection, removal or extermination methods are necessary to prevent pest entry via the incoming materials, and otherwise.

It may be found from a practical operating viewpoint that the apparent ideal measure cannot be recommended. In this case an alternative or next-best recommendation is in order.

Personal Relationship Important

Finally, the pest control operator must recognize that he has a problem in personal relationship with management. With the possible exception of some government agencies, plant operations are subject to severe scrutiny with respect to costs. Food plant management, like any other, seldom has any problem *spending* its budget. While the sanitarian may have a background of academic training, his approach to the administration of his program in any plant should be related to plant functioning. In his dealings with management he should evidence at all times an understanding of that which is practicable in relation to costs. In other words, any person administering pest control in a plant must avoid becoming the *biggest pest* in the plant, in the eyes of the people for and with whom he is working.

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PEST CONTROL

news

"Pest Control In Third Era," Buettner Tells Hygienic Group

"Our industry is now in its third era, one in which specialization and application know-how

William O. Buettner speaks at banquet

are of paramount importance." So said National Pest Control Association executive secretary William O. Buettner at the March 18 banquet of the Hygienic Sanitation Co. in Philadelphia.

One hundred fifty firm members and guests heard Buettner evaluate the progress their industry has made since its inception. He characterized the period before 1925 as being run on a "hit and miss" basis, with little or no attempts to standardize control measures. "Today," he said, "no reputable operator would think of using such materials as cresylic acid, oil of mirbane, smudge rags to bring rats into the open or other compounds widely used in the first part of this century.

"1926 to 1945 was a time of adjustment," he continued, "when we began to see the importance of utilizing better techniques in our application procedures. Education during this time was all-important. We began making the type of contacts with public health agencies, entomologists and other authorities which showed the increasing importance of our industry. This is born out by the way we were treated as an essential activity during World War II.

"The third era," Buettner said, "began after the war and runs through the present time. PCOs now have an obligation to practice preventive control wherever possible. It's not enough to sit back and wait for infestations to develop. Too, people are better informed on control procedures. Clients know it takes intelligent handling of the newer pesticides to give a satisfactory job. It's up to PCOs to fulfill this expectation, without endangering the lives or health of the public."

Concluding his address, Buettner praised such old-timers as Charles Callahan, Robert Zimmerman, William Dorn, Hamilton Brehm, John Buckley and Charles Showers, all of whom have been with Hygienic Sanitation Co. more than 25 years.

Kansas Receives Grant To Study Wasps

Kansas State College in Manhattan, Kansas has received a $9,500 grant from the National Science Foundation to study behavior patterns of certain solitary wasps, entomology head Professor Roger C. Smith reports.

Professor Howard E. Evans, also on the school's entomology staff, will conduct the work over a three year period. Dr. Evans is a widely known authority on spider wasps.

Since there is no contact between successive generations of these insects, these hymenoptera have little opportunity to learn by trial and error. For that reason it is hoped the studies will strike at the origins of certain behavior patterns, and furnish new knowledge about their mechanisms of behavior.

Halt Yellow Fever Spread

Jungle yellow fever, killer of 400 Brazilians since last year, is now being brought under control in that country, health authorities report.

The disease is carried by a mosquito species which lives only in forests.

Velsicol Adds Two

Velsicol Corp., Chicago, Ill., has named Dr. John C. Herron to its technical sales and service staff,

Velsicol's **Anderson** (left) and **Herron**

and appointed M. L. Anderson as its southern insecticide sales representative.

Dr. Herron was previously an instructor in agriculture and entomology at North Carolina State College. He will represent the firm in the Chicago area.

Anderson, a graduate of the University of Florida, was associated with the Virginia Smelting Co., West Norfolk, Va. His headquarters is in Texas.

Canada PCOs Swarm In Montreal

PCOs from all corners of Canada and the U. S., too, are meeting in Montreal, May 12-14, for the 10th Annual Canadian Pest Control Operator's Conference. All regular sessions are being held on the campus of the University of Montreal.

Plenty of late information on ant, moth and rodent problems is being discussed, with an evening gathering set aside for such business headaches as pricing, advertising and insurance.

Officially representing the National Pest Control Association at the meeting is Dr. Ralph E. Heal, NPCA technical director.

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American Chemical Society Reviews Significance Of Pesticide Residues At April 2-3 Milwaukee Meeting

Whenever insecticides are used in the protection of foods and food products, there arises the potential problem of residues in the marketed product. Principal concern is with insecticides applied to the growing plant, but materials applied on wall surfaces, machinery, and in storage areas also present a potential residue problem. Food and Drug hearings which took place in Washington in 1950 resulted in the compilation of a vast amount of information, but no official tolerances have as yet been established on the newer insecticides. The Milwaukee symposium served to bring the chemical industry up to date on the various problems involved in safe and effective use of new insecticides, and to bring to the foreground any new developments.

Highlights of Various Papers:

Avery S. Hoyt chief, Bureau of Entomology & Plant Quarantine. Although nearly 1,000,000,000 pounds of insecticides were used on crops in 1951, greater amounts may be necessary in the future to increase our per acre yield and thus meet the food demands of the world. With this use may arise new residue problems.

F. C. Bishopp. B.E.P.Q. USDA. A variety of insecticides (about 50 different ones now for sale) are available and the majority appear to be necessary to control the 6000 economic pests on diverse crops and in different types of structures. In spite of the variety of insecticides, methods of application can be generally considered more important than the chemical used. The introduction of systemics has greatly complicated the residue problem and may preclude their use on edible plants. DDT, although used on bin linings, cannot be tolerated on grain itself. The appearance of resistance complicates the hazard problem since it invariably leads to an increased number of applications and heavier dosages of insecticides.

A. S. Lehman, Federal Food and Drug Administration. The permissibility of an economic poison or the establishment of tolerances is dependent on concrete residue data. More of this is needed. Yardsticks used to establish mammalian toxicity include (a) acute and chronic effect on normal physiological processes, (b) direct damage to body tissues, (c) tissue storage of the insecticide, and (d) chemical change in the product which may take place in the body. It was pointed out that parathion, although it is immediately toxic to an animal, is not stored even though introduced in relatively large quantities in a diet. Heptachlor, the principal active constituent of chlordane, is converted into a more toxic material within the body, and can be traced in milk of the animal up to 50 days after introduction. It is also noted that little has been done on the toxic effect resulting from the addition of adjuvants to various insecticides.

B. E. Conley, American Medical Association. Mr. Conley pointed out that no one exercising impartial judgment can fail to acknowledge that residues constitute a health hazard. In discussing parathion, he indicated that little toxicity ever results from actual vapors, but from finely suspended particles or dusts.

J. R. Wilson, Council on Food and Nutrition American Med. Assoc. In discussing the role of air, water, and food as media for intake of toxic materials, he emphasized the role of lindane vaporizers and stated he highly questioned the right of one man to contaminate another man's air!

H. E. Longenecker, Food Protection Committee, National Research Council. Committee was formed to (a) integrate the thinking of various state, federal and private agencies, (b) evaluate intentional and incidental additions in foods, (c) develop standards, and (d) prepare and aid in distribution of essential information.

J. A. Noone, National Agricultural Chemicals Association. Authority contained in the Federal Insecticide, Fungicide, and Rodenticide Act and the Federal Food, Drug, and Cosmetic Act is adequate for the protection of public health. Only seven products have ever been registered under protest and none of these involved the safety of the public.

C. E. Palm, Dept. Entomology, Cornell University. Pesticides afford the most certain and economical means known for keeping pest populations at safe levels. All concerned with pest control are working towards a common objective of receiving the maximum benefits in production with safety to the consumer and producer.

T. C. Allen, Dept. of Entomology, Wisconsin. The use of newer insecticides is highly desirable to produce vegetable crops economically. Because of their effectiveness, fewer treatments are needed, which correspondingly reduces cost for labor, material, and application. With fewer treatments, there may be less mechanical injury to the crop. (With slight rewording, this might well apply to pest control.)

E. F. Knipling, B.E.P.Q., USDA. Livestock are subject to attack by a number of serious pests which affect the health and production of these animals. Milk yields, for example, have been reduced as much as 10-20% by the presence of flies. It is essential, therefore, to employ insecticides for maximum production of meat, milk, and animal fibers. Such control can add an estimated $800,000,000 to the income of livestock owners in this country.——DDT is a relatively safe insecticide for control of livestock pests, but direct application on dairy cattle has resulted in small amounts appearing in milk. Lindane, although it may appear in milk immediately after spraying, is quickly eliminated from the body within a period of about 3 days. Pyrethrum compounds, though effective, are costly and must be used frequently; as a result their use is generally limited to valuable animals.

Walter Ebeling, Div. Entomology, University of California. When applying a solution, "run-off" and "drain-off" mean two different things. If a solution tends to run off quickly, it usually indicates too little wetting; if it drains off, the surface has been wet excessively. With suspensions, preferential retention of the particles can be brought about by the inclusion of deposit builders. The substrate is of utmost importance when considering additives, e. g. the addition of glue on glass is a good wetting agent, but on a waxy surface it is poor. Insecticides in solution have a tendency to come to the surface after penetration, thus presenting a toxic surface for a prolonged period of time. ——With respect to aerosols, several factors prevent deposition of insecticide on the surface. The layer of resistance at surface around objects, electrostatic conditions, and convections currents. ——Although emulsions are usually more effective as space sprays, wettable powders have greater residual properties.

W. M. Hoskins, Div. Entomology, U. of Calif. The goal in pesticide application is maximum deposition at the appropriate place in the most toxic form possible. This always involves movement from a container through the air to the surface. Secondary contamination often results from the effects of this step.

L. W. Hazleton, Hazleton Laboratories, Falls Church, Va. The human skin is susceptible to three major reactions: primary irritation, sensitization, and penetration. One cannot always tell whether a material does penetrate, and in the case of parathion, it can happen without outward irritation. Some materials penetrate readily but are not toxic.

H. L. Haller, B.E.P.Q., USDA There has been a tendency to place emphasis on the hazards created by new insecticides rather than on the great benefits derived from their proper use. Pesticides are in a different class from chemicals that, for various reasons, are purposely added to foodstuffs.

G. C. Decker, Illinois Natural History Survey. Vapor pressure of an insecticide is a major factor in determining the rate of residue loss from various surfaces. Residues will tend to disappear in the order of volatility of the particular insecticide with parathion, lindane, aldrin, chlordane, dieldrin, toxaphene, and DDT disappearing in the order named. Time of application on food plants is important since the increment of growth decreases the parts per million of residue. There is probably a very significant loss in insec-

(Continued on page 43)

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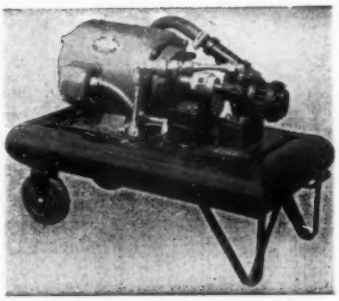

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Save money by cutting man-hours of work and equipment up-keep with the portable PRESHUR-MITE. 5 models to select from. Electric or gasoline powered. Weigh from 44 to 127 lbs. each. Pressures up to 225 lbs. psi and up to 5 gallons of liquid per minute. Fully equipped ready for use, priced from $145.75 to $359.15 f.o.b. Jackson, Miss. Write for further information and prices.

Prices subject to change without notice.

"The choice of the industry and operator"

EWING MANUFACTURING CO.

P. O. Box 1986 **Phone 3-0343** **Jackson, Miss.**

SELL The Freshener That Does a Complete Job!

Scent-Flo **THE NEW** *Makes air Fresh as a Daisy*

Completely Adjustable

FAN-OPERATED AIR FRESHENER

SCENT-FLO NEUTRALIZES AND DESTROYS ODORS THE POSITIVE WAY . . . provides "Just a Breeze of Pleasantness." It is precision-made and scientifically developed — the only adjustable unit of its type in the country. Made of lifetime aluminum in gorgeous, permanently anodized metallic colors: Red, Gold, Silver, Green. Unlimited use — handsome enough for any office, showroom, factory or home. The Scent-Flo fan-operated electric scent-conditioner maintains complete control over the uniformity and quality of air freshness — can be easily installed in a matter of minutes. No other method of deodorizing guarantees such continuously effective results at such little cost to its users. Scent-Flo refill lasts *an entire month*. For those already in the deodorizing field — we can offer the finest refills, either disc or liquid, available today.

Strikingly New and Different — the SCENT-FLO AIR FRESHENER is a proved best seller that's sure to be a standout. Guaranteed to give complete satisfaction — build new sales and also repeat business in refills. Prices are right for the customer — profits are right for the dealer. Can be easily handled on a rental or sale basis. Every customer you presently serve is a potential user of Scent-Flo.

ONLY SCENT-FLO CAN BE ADJUSTED TO MEET ALL AREA REQUIREMENTS

DEALER: If your business needs a sure-fire item, WRITE NOW for details.

Scent-Flo **DISTRIBUTING COMPANY**
5160 PENN AVENUE • PITTSBURGH 24, PA.

Abash Fetes Wearers O' Green

St. Patrick's Day celebrants in Harlingen, Texas, got a send-off from Abash Insect Control Co. this March 17.

Shamrocks, clay pipes, and green toppers were distributed by the company to the populace in a combination good will and direct advertising promotion. Attached to the shamrocks were such slogans as "Abash adds a 'little bit of heaven' to your home", and "Clancey lowered the boom on bugs. He called Abash."

Radio broadcasts over two Rio Grande Valley stations were used to stimulate interest in the campaign. Each slogan slip attached to the shamrocks carried the firm's name and telephone number, and two were marked to give the owner a free Abash Co. control job.

The company is owned by National Pest Control Association member J. J. Daniels.

Go the scientific way...go **MGK**

AEROSOL INSECTICIDE CONCENTRATES

SPRAY INSECTICIDE CONCENTRATES

DUST INSECTICIDE CONCENTRATES

You may want complete formulas . . . ready to put right into your aerosol bombs or your retail packages. You may want combinations of insecticides and synergists that leave you only the minimum of processing to do. You may want to do most of the processing yourself and to you we offer the purest toxicants and synergists in their primary forms. MGK has the *best* of whatever you want. The emblem "MGK" is satisfying assurance of high efficiency and scientific production in insecticides and insecticide ingredients. Let this single experienced source help you make better products for less money. For complete information about MGK prices write 1703 Southeast Fifth St., Minneapolis, Minn.

Scarabaeus sacer
Sacred beetle of ancient Egypt. Model for carved stone amulets and scarabs.

THE PIONEERS OF
PYRETHRUM AND ALLETHRIN

Good insecticides protect America's health and harvest.

McLAUGHLIN

GORMLEY

KING COMPANY

Hyman & Co. Faces Shut-Down Over Court Ruling

Julius Hyman & Co., Denver, Colo., must close immediately, unless a recent court order is softened, declares Dr. Julius Hyman, president of the firm.

"We cannot operate under the present order," he says. "A judgment in a previous suit has bled us white. With this new blow, it just won't be in the cards for us to operate unless there is some modification."

The court order, handed down by Denver district judge Robert W. Steele, holds that the company must stop making and selling aldrin and dieldrin, on the claim that formulae for these insecticides are the property of the Velsicol Corp., Chicago, Ill. It is the court's opinion that the basic ideas for these formulae were developed while Dr. Hyman was associated with the Chicago firm.

As we go to press, we learn that Shell Chemical Co. is now negotiating for the purchase of Julius Hyman & Co.

Velsicol charged that Dr. Hyman has profited illegally from sales of these insecticides, because he signed a contract while at Velsicol, assigning all patents and materials developed in the laboratory to that firm.

His company "definitely" will appeal to the supreme court, Dr. Hyman further states.

Vaporizer Uses Methoxychlor

Industrial Purchasing Agency has a new vaporizer and insecticide compound on the market which has good selling points to the safety-conscious customer. Their new Modernaire vaporizer uses Emex, a methoxychlor insecticide compound, instead of the usual lindane-based preparation.

Company officials say no warning signs need be posted when these machines are put up, and they suggest the units may solve the problem of DDT and lindane resistant flies.

Distributorships are open. You can get additional information by writing the Industrial Purchasing Agency, Sales Division, 33 West 32nd St., Bayonne, N. J.

KILL FLYING INSECTS *the Easy Way!*

with

COLUMBIA'S INSECTICIDER

Made by the makers of the famous line of Glyco-Master Vaporizers

Today there are dozens of manufacturers making electric vaporizers for killing flying insects. Practically all of them are using Lindane. Every dealer knows how effective they are and how they operate. The real difference in a machine of this type is how well it is constructed, and how reliable the manufacturer is.

Columbia Chemical Co.—pioneers in the vaporizing unit field, produce the famous Glyco-Master for the control of colds and other upper respiratory infections. It is the outstanding Glycol Vaporizer on the market today. They are now producing a top quality, fully automatic, vaporizer for flying insect control called the INSECTICIDER.

Here is a machine of durable steel construction—

- ★ Built for years of trouble-free and economical operation.
- ★ Made to conform with State and Federal requirements.
  Thermostat for temperature control • Overload fuse to prevent excessive output • Pilot light
- ★ Guaranteed for 2 years.
- ★ Priced right for easy selling—and substantial dealer profits.

Write today for complete information.

Columbia Chemical Co., Inc.

154 E. Erie Street • Chicago 11, Illinois

Columbia—"The Gem Of The Glycol Vaporizers"

This year switch to

Hi-Gam® E-20...

The power-packed, 3-way, residual bug killer made with lindane

For both residential and industrial control of flies, mosquitoes, gnats, ants, roaches, silverfish, carpet beetles and similar pests—choose Pennsalt's Hi-Gam E-20.

Made with 20% lindane, this power-packed, 3-way bug killer has a residual potency that remains effective 3 to 6 weeks after application, depending on weather and other factors.

In addition, Hi-Gam E-20 is a truly *economical* insecticide. It comes to you in concentrated form. Care in making up Hi-Gam E-20 sprays will save you more than a little money over a season's operation!

Don't delay! Send in the coupon now for free copies of Pennsalt Pest Control Bulletin #203. This comprehensive bulletin includes an easy-to-use table showing just how to make 0.5% lindane and 5% DDT sprays without waste of the concentrated emulsion, as well as many other helps for the P.C.O. Mail the coupon today!

PENNSYLVANIA SALT MANUFACTURING COMPANY
Philadelphia 7, Pa.
Bryan, Texas — Montgomery, Ala.

OTHER PENNSALT PRODUCTS FOR THE PEST CONTROL OPERATOR

Hi-Gam W-25
Hi-Gam 99
BHC E-11
WB-50
DDT Technical
Penite® 6
DDT Emulsion 34

Progressive Chemistry for over a Century

Pennsalt Chemicals

Pennsylvania Salt Mfg. Co.
Philadelphia 7, Pa.

Please send me_____FREE COPIES of Pest Control Bulletin #203 . . . for myself and my operators.

Name_____

Address_____

City Campaigns . . .

• In Jersey City, New Jersey, residents are bracing themselves for the annual spring onslaught of mosquitoes. C. Harry Callari, treasurer of the Hudson County Mosquito Extermination Commission, says his organization is putting preventive measures into effect immediately. He thinks mosquitoes breeding in immediate urban locations can be controlled, but says those living in the salt marshes along the sea coast will be extremely difficult to eliminate. Hurricanes of two years ago, he states, damaged or destroyed most of the dams and dikes used for draining these areas.

• In Rosemead, California, health officials are going all-out to rid the city of flies. Educational displays are being placed in shop windows emphasizing the importance of attacking flies early in the season. Citizens' committees are trying to get cooperation from individual home and business owners in keeping their premises free of potential breeding spots.

• In Livermore, California, citizens are being urged to give the same kind of cooperation against mosquitoes. The Alameda County Mosquito Abatement District is asking the populace to seek out potential breeding places and eliminate them. Illustrative films on mosquito control are being made available to community clubs on request. Most of the mosquitoes here come from coastal salt marsh regions, as they do in New Jersey.

• In Kansas City, Mo., urban redevelopment wrecking crews have uncovered hordes of rats while tearing down tenements. "The problem is serious," says Dr. Lloyd R. Gates, public health engineer. Steps were taken to eliminate rats before the wreckers moved in. Dr. Gates says the problem was simply underestimated, and not enough rodents were killed. In one house alone, over 200 live rats were found. Owners of structures near the housing area are responsible for hiring PCOs to destroy rats in their establishments. Three warrants already have been issued for arrest of persons failing to cooperate.

have you tried.. the "RAT JIGGER"* RODENTICIDE CONTAINER a professional "tool" for PCO'S

• IT'S TIP-PROOF!
The special flared skirt fits flush to floor all around...will not tip even if a rat steps on the edge of the container.

• IT'S TESTED AND APPROVED!
Tests show no signs of leakage of seepage after 18 days. Specifications call for 3 days.

• IT'S SEAMLESS!
One-piece construction, pressed into form under tons and tons of pressure from special water-resistant stock. Holds ⅗ fluid ounces.

• IT'S STURDY!

• IT'S EASY TO PICK UP!

• IT'S A TIME-SAVER!

• BUILT-IN SAFEGUARDS!
Distinct in appearance. No mistaking it...in shape...in color...and warning...poison and skull and cross bones symbols all over it.

• MEETS RIGID SPECIFICATIONS!
"Rat Jiggers" meet all specifications of Federal agencies and National Pest Control Association.

*Trade Mark Patent Pending

• THE STANDARD FOR QUALITY AND SAFETY as incorporated in Standard Safe Handling Procedure for Compound 1080 and other Liquid Poisons.

Packed 5000 to a case *Prices per 1000*

5 M-25 M . . . . . $5.62 M
Minimum orders 4 cases shipped prepaid.
Larger quantity prices on request.

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☐ Send samples and full information.
☐ Ship through nearest distributor.
☐ C.O.D. ☐ Check enclosed.
No. 1080 RAT JIGGER* Rodenticide Containers
Print Name .....
Street .....
City ..... Zone ... State .....

FTC Charges d-Con

On March 15, 1952, the Federal Trade Commission issued a complaint (5958) charging the d-Con Co., Inc., and United Enterprises, Inc., both of 531 W. Webster Ave., Chicago, with misrepresenting the effectiveness of three rodenticide preparations.

Leonard J. Ratner, Jerome S. Garland and Gerald H. Rissman, officers of the corporations, are also cited as respondents.

The preparations involved in the proceeding are sold under the names d-Con, d-Con Ready Mixed and d-Con's Mouse-Prufe.

"The complaint alleges that the respondents' advertisements have represented falsely that d-Con is non-poisonous and completely safe and may be used without danger to humans and animals; that it will destroy all rats and mice on a property within 15 days, and will thereafter keep the property freed from rats and mice; that it contains a special

attractant which is three times "more successful or luring" than any other rodenticide bait or regular feed; that it will eliminate all after-odors usually associated with the use of rodenticides; that it has been recommended by the U. S. Public Health Service and the U. S. Fish & Wildlife Service; and that it will eliminate all rats and mice infesting a town and that the town will remain free from reinfestation.

"The complaint also challenges as false the representation that d-Con's Mouse Prufe is the only mouse-killing insecticide on the market that contains the ingredient warfarin.

"In advertising the rodenticides, the respondents, according to the complaint, represented falsely that d-Con was the subject of an article in Reader's Digest. The article referred to, the complaint says, dealt with 'Warfarin,' which is one of the ingredients in d-Con."

A hearing in Washington, where the company may present its answers, is being scheduled.

NYC Wants Carbon Tet Label Change

There's been a large number of accidental deaths in New York recently from misuse of carbon tetrachloride preparations. City health officials want to do something about it by making an amendment in the sanitary code to require special labelling of products containing carbon tetrachloride sold within the city.

Here is the proposed amendment:

"No person shall have, keep or offer for sale or give away in the city of New York any product, apparatus or device containing any carbon tetrachloride unless it bears a label on the front of the immediate container and the outside container or wrapper on which there shall be clearly printed, within a red border, in red letters that are not smaller than the directions for use, the following caution:

CONTAINS CARBON TETRACHLORIDE
DANGER!
HAZARDOUS VAPOR AND LIQUID
MAY BE FATAL IF INHALED OR SWALLOWED; DO NOT TAKE INTERNALLY;
DO NOT BREATHE VAPOR;
USE ONLY WITH ADEQUATE VENTILATION;
AVOID PROLONGED OR REPEATED CONTACT WITH SKIN;
KEEP AWAY FROM CHILDREN."

Recommendations will be made that effective date of this amendment be three months after its adoption by the Board of Health, to give industry time to revise its present labels.

Edwin Ludewig, director of New York's Bureau of Food & Drugs, says he would appreciate comments on the proposed amendment by manufacturers and dealers concerned. He can be reached at New York City's Department of Health, 125 Worth Street, New York 13, N. Y.

Chemical Society Report

(from page 38)

ticide during the first hour after application, and this is materially influenced by the solvent-carrier. With the ever increasing demands for food, a certain calculated risk must be taken with respect to small amounts of chemicals consumed.

J. L. St. John, Food Protection Committee, Nat. Res. Council. To date no tolerance levels on new insecticides have been set by the Food and Drug Administration, but the state of California has established some which may well be similar to the eventual federal levels. Of the thousands of samples examined in that state in 1950, nearly 100% were within the tolerances established. It is estimated that not over 1 ppm average occurs on any food and that only 1% of our food carries any residues at all. This is an indication that we are keeping within the bounds of practical application.

stop mice damage

Overnight

with Larvacide®

It's hard to bait or trap mice . . . but not to gas them. After closing Saturday night, pour liquid Larvacide on sacks and FUMIGATE your warehouse to kill 100% of your mice by Sunday morning.

A single pound of this powerful fumigant goes for 4,000 cubic feet of space on the average for both rats and mice - as much as 8,000 cubic feet for mice alone.

ISCO

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CHICAGO • CLEVELAND • PHILADELPHIA
SAN FRANCISCO • LOS ANGELES
SUBSIDIARY: E. S. BROWNING CO., INC.
SAN FRANCISCO · LOS ANGELES

STOP YOUR MICE DAMAGE

Overnight

Write for Technical Bulletin No. 1004. Larvacide is promptly available in steel cylinders 25, 50, 100 and 180 lbs. net, and in 1 lb. bottles each in metal can 12 to carton. Trade discount to PCOs for four-carton orders. Always carry a few cans of Larvacide in your service cars.

Board members of the National Sanitary Supply Association: Standing (left to right) **Searcy Ridge**, director, **George Flanagan**, central regional vice-president, **Phillip Shore**, secretary of the board, **Charles Solly**, director, **Malcom Zucker**, director, **Bernard T. Kelly**, NSSA assistant executive secretary. Seated (left to right) **Sam Newman**, eastern regional vice-president, **W. A. Tucker**, director, **Leo J. Kelly**, NSSA executive vice-president, **Martin Peters**, president, **Harold Pond**, director, **David Ginsburg**, vice-president, **Herbert Baum**, western regional vice-president. Officers missing from the photo include **Arthur Boller**, treasurer, **Charles Sheppard**, southern regional vice-president, and **T. W. Smith**, southwestern regional vice-president.

NSSA Chicago Convention Elects Peters President

Martin Peters, Moore Brothers Co., 100 Warren Street, New York City, is new president of the National Sanitary Supply Association, elected at its 29th annual convention and trade show staged at Chicago's Conrad Hilton Hotel, March 23-26.

Others chosen include: Dave Ginsburg, Scientific Supply Co., Denver, Colo., vice-president; Arthur Boller, S. C. Lawlor Co., Chicago, treasurer; Philip Shore, Shore Metal Products Co., Los Angeles, secretary of the Board; Samuel Newman, Creco Co, Long Island City, N. Y., Eastern regional vice-president; Herbert J. L. Baum, Mipro-Metal Products Co., San Francisco, Western V. P.; George Flanagan, Federal Varnish Co., Chicago, Central regional V. P.; C. R. M. Sheppard, Fenole Chemical Co., Jacksonville, Fla., Southern regional V. P.; T. W. "Bud" Smith, The Bancroft Paper Co., Inc., Shreveport, La., Southwestern regional V. P.; and the following directors: Harold J. Pond, Advance Machine Co., Minneapolis, Minn.; Searcy Ridge, Gateway Chemical Co., Kansas City, Mo.; Charles B. Solly, Harley Soap Co., Philadelphia; W. A. Tucker, Moellering Supply Co., Inc., Fort Wayne, Ind.; and Malcolm Zucker, State Chemical Manufacturing Co., Cleveland, Ohio.

Of the 135 exhibits on the convention floor, here is a partial alphabetical list with products displayed which are of particular interest to our readers:

Airkem, Inc., 241 E. 44th St., New York 10, N. Y., odor counteractants.

American Dispenser Co., Inc., 115 E. 23rd St., New York 10, N. Y., soap dispensers.

Baird & McGuire, Inc., Holbrook, Mass., disinfectants, insecticides and cleaners.

Bostwick Laboratories, Inc., 706 Bostwick Ave., Bridgeport, Conn., private label aerosol insect bombs, air sanitizers, moth proofers, etc.

Breuer Electric Mfg. Co., 5100 N. Ravenswood Ave., Chicago, Ill., portable vacuum cleaners for plant sanitation programs.

Chase Products Co., 1816 West St. Charles Rd., Maywood, Ill., aerosols, pressurized products, insecticides, rodenticides.

H. D. Hudson Mfg. Co., 589 E. Illinois St., Chicago 11, Ill., sprayers and dusters, application equipment for health and sanitation.

Hysan Products Co., 932 W. 38th Place, Chicago, Ill., Hytron insecticide vaporizer, and a complete line of sanitary chemicals.

Keystone Scent Conditioner Corp., 312-15 N. 1.th St., Philadelphia, Pa., Keythol Electric Deodorizer and scent blocks.

Moore Bros. Co., 101 Warren St., New York 7, N. Y., soap dispensers.

Scent-Flo Distributing Co., 516 Penn Ave., Pittsburgh 24, Pa., Scent-Flo adjustable, fan-operated air freshner.

Silver Creek Precision Corp., Silver Creek, N. Y., Micro-Sol aerosol equipment.

Solvay Sales Division, Allied Chemical & Dye Corp., 40 Rector St., New York, N. Y., paradichlorobenzene, orthodichlorobenzene.

James Varley & Sons, Inc., 1200 Switzer Ave., St. Louis, Mo., deodorants, air sanitizers, germicides, pine oil disinfectants.

Although exact registration figures were not released, it is estimated nearly 1000 persons saw the displays during this three and a half day show.

DuPont To Mark 150th Birthday

E. I. duPont deNemours & Co. will celebrate its 150th anniversary July 18 on the banks of Brandywine Creek, a few miles from the firm headquarters in Wilmington, Del.

The stream is the site of the first duPont powder mills, erected shortly after the Revolution.

PEST CONTROL

notebook

by Jack Ratcliffe

"Lobster" Roach

From the tropics comes a new structural pest. *Nauphoeta cinerea* (oliv.) is its technical name.

Arrow points to peculiar markings on thorax of "lobster" roach

It could be called the "lobster" roach because of the lobster-like design engraved on its collar. Specimens for identification were forwarded to C. F. W. Muesbeck, head of the U. S. Department of Agriculture, division of insect identification. Dr. A. B. Gurney, divisional roach specialist, identified the insect.

Lobster roaches have often been collected from imported materials, but to the best of knowledge, no previous records exist of this species taking root in the United States.

Now, however, one PCO entomologist in Tampa, Florida, reports heavy infestations of this species in a number of food-handling establishments in his city. From the sizes of colonies and quantity of droppings, it would seem the roaches have been entrenched for several years. Just how many years hasn't been determined yet.

The question naturally follows: How far have they spread? This is one we can't answer yet. We'd like to hear from PCOs who find infestations of *Nauphoeta cinerea* in their area.

Here's what the new pest looks like. Adults are about 1¼ inches long and about 7/16 inch wide. Wings are shorter than the body, leaving edges and tip of the abdomen in view. The abdomen is especially distended just before young are born.

(Continued on page 54)

CRE-O-TOX
TERMITE CHEMICALS

have 20 years of satisfactory and effective service behind them.

TOX-EOL 12½ to 1 CONCENTRATE

contains not one but a combination of toxic elements including pentachlorophenol, which have been found most satisfactory in the control of subterranean termites and are acknowledged by authorities to be more effective than any single toxic element.

SOLD ONLY TO PCO'S

Write for our dealer plan with 5 year Warranty.

Exceptional sales literature and advertising helps available to licensed contractors.

CRE-O-TOX Chemical Products Company

Broad at Union R. R. **P. O. Box 5026** **Memphis (12) Tenn.**

Pioneers in the use of chlorinated phenols for termite control.

PLASTIC
PINTS & QUARTS

LOOK AT THESE LOW PRICES

	Pints	Quarts
In Gross Lots	36c ea.	72c ea.
In Half Gross Lots	40c ea.	80c ea.
In Dozen Lots	48c ea.	96c ea.
In Less Than Dozen Lots	60c ea.	$1.20 ea.

Complete With

POLYETHYLENE CAPS

Won't break, shatter, chip, burst in winter if emulsions freeze, soften or deteriorate. Send your order now . . . while they last!

PCE **Pest Control Equipment Co.**
47 W. 43rd St. VAnderbilt 6-5390
New York 18, N. Y.

Now Ready for Marketing

REVOLUTIONARY NEW

EMEX*

Methoxychlor Insecticide Compound for use with MODERNAIRE* VAPORIZER

Better Because:

1. Safer, Less Toxic — No Warning Signs Necessary!
2. Can be used where flies are immune to DDT, Lindane!
3. Will not deteriorate under extreme heat!

Territories Open

For Further Information write to

Industrial Purchasing Agency
Sales Division
33 West 32nd Street
Bayonne, New Jersey

*Pat. Pending

Hysan Co.'s new vaporizer-deodorizer

Hy-Tron Knocks Out Insects, Odors

Hysan Products Co.'s new insecticide vaporizer "Hy-Tron" does a two-fold job: killing flying insects and destroying annoying odors.

Both operations can be carried on simultaneously or separately by flicking an electric switch. A motorized fan, built right into the machine, provides continuous fresh air, while the heating element vaporizes a lindane-based tablet. Construction of the unit is based on latest governmental requirements.

Distribution of vaporized insecticide is aided by the forced draft of an electric fan. The machine is so designed that it can be touched without fear of burning fingers or hands. The company unconditionally guarantees it for one year, and believes the unit should last more than ten years without major repairs.

Hysan Products Co. will furnish more information on their product. Write the firm at 936 W. 38th Place, Chicago, Ill.

USDA Forms Report Service

A cooperative insect pest survey and reporting service is announced by the U. S. Department of Agriculture. Entomologists associated with state agencies, industry and the federal government will participate. Purpose of the program is to keep the nation's farmers informed on impending insect threats.

Mosquito Control: Don't Depend On Chemicals Alone, USDA Says

Recent Bureau of Entomology & Plant Quarantine tests in Florida and California show that mosquitoes are definitely more resistant to DDT than seven years ago. They are not, however, noticeably resistant to such newer insecticides as lindane, chlordane and BHC. It is noted that the resistance build-up has been gradual and will continue, unless some non-chemical control measures are instituted. Here are a few of the department's recommendations:

Place more emphasis on draining and filling breeding areas. Stock water areas with fish which feed on mosquito larvae. Use less chemical controls on larvae, if it's practical to direct control work against adult forms. There is some evidence that resistance builds up more quickly if insecticides are used on larvae. If practical, control of adults is usually more economical, and leaves less opportunity for increase of highly resistant strains.

SMITH SPRAYERS

"THE DEPENDABLE PROFIT LINE SINCE 1888"

TO SHOW THEM IS TO SELL THEM

A COMPLETE LINE of hand, continuous, compressed air, knapsack, bucket, wheelbarrow and barrel sprayers. Also hand and crank powder insecticide dusters. We are the originators of sprayers and our products are of outstanding quality in engineering, modern design and performance.

Streamlined BLIZZARD

COPPER CONTINUOUS SPRAYER

The World's Most Beautiful Sprayer

Twin Nozzle

Made in 2 sizes: Pint, Quart

World's finest continuous sprayer. Large, glistening solid copper tank. Pump barrel is highly polished brass seamless. Appealing, modern design. Sprays any liquid. Pint, Quart (39 ounce). Strongest construction. Extremely popular. A fast seller.

FLAME GUN SPRAYER

HUNDREDS OF USES

2000 degrees controlled heat. Destroys weeds, brush, rubbish. For burning safety strips and fire lanes. 4 gal. tank. 7 ft. oil proof hose. Light. Compact. Portable. Burns kerosene or range oil.

E-Z 5 GAL. KNAPSACK SPRAYER

Finest knapsack sprayer made. Pump lever develops high pressure easily while spraying. 5 gal. zinc-grip steel or copper tank. Tank is air conditioned preventing dampness reaching the back. Adjustable brass nozzle. (Recommended by Extension Services.)

SPEEDEX GARDEN & TREE SPRAYER

Solid brass. Large adjustable nozzle for spraying trees, shrubbery, flowers, weed killing, etc. Sturdily built. Low priced. In big demand.

D. B. SMITH & CO. 426 MAIN ST. UTICA 2, N. Y.

"ORIGINATORS OF SPRAYERS SINCE 1888"

SOUTHERN TERRITORY: BENJ. D. SMITH, JR., BOX 847, SANFORD, N. C

CANADIAN REPRESENTATIVE: GORDON L. CONDON, 1265 STANLEY ST., MONTREAL 2, CANADA

SEND FOR CATALOG DESCRIBING THESE AND OTHER ITEMS

Martindale Protective Masks

PLACE HEADBAND WELL UP AROUND HEAD TO KEEP FROM SLIPPING DOWN
PRESS NOSE TABS IN CLOSE AGAINST FACE TO HOLD PAD AGAINST THE NOSTRILS
PRESS EDGES OF FACE PLATE DOWN TO FIT FACE SNUGLY

. . . Weigh less than ½ ounce

Clean, cool, comfortable. Furnish excellent protection against non-toxic dusts except free silica. Replaceable cotton pads are inexpensive and sanitary.

Protective Masks ..... $.30 ea.
No. 1 Refills (standard wt.) .02 ea.
No. 2 Refills (heavy wt.) .02½ ea.

Masks packed in individual envelopes. Refills packed in envelopes containing 25.

No. 2 Refills (heavy wt.) contain twice as much filtering cotton as No. 1.

DISCOUNTS

Less than $10.00 list....Net
$10.00 to $24.99 list 10%
$25.00 to $99.00 list... 15%
$100.00 and over 20%

Minimum charge account or C.O.D. $2.00
Minimum, cash with order $1.00

If payment accompanies order we will pay parcel post or express charges.

Martindale Electric Co.
1367 Hird Ave., Cleveland 7, O.

PROVEN PROFIT* MAKERS

THROUGH THE YEARS

*PROOF ON REQUEST

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DEALERS GET **FREE** ADVERTISING PROMOTION AIDS LAB. ASSISTANCE ETC.

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CHEK PRODUCTS CO., Inc.

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Vaccinol

FOR TERMITES

WOOD PRESERVATIVE

for TERMITES and POWDER POST BEETLES

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Ready-to-use **Effective** **Economical**

Penetrates wood quickly • Requires no mixing • Does not stain wood or painted surfaces • Remains active for years • Control moisture that causes mold and decay • Safe and easy-to-use • Requires no mask

Exclusive Franchise available to responsible PCOs

Send Us Your Orders For
PENTAchlorophenol Concentrate 1 to 10

The VACCINOL Products Corporation

P. O. Box 3205 Phone 9-1166 Memphis 9, Tenn.

If your insecticide needs-

GREATER KILL

LONGER FLOAT

Investigate

Penn-Drake Insecti-Sol

A PURE, ODORLESS SOLVENT

Completely free from objectionable odor and stain, Penn-Drake Insecti-Sol is a 100% volatile solvent which will assist in attaining greatest kill for any insecticide because of its long floating characteristics. Insecti-Sol is highly recommended as a base for all insecticides, and it is particularly outstanding as a solvent for DDT solutions or DDT crystals in low concentrations.

OTHER USES FOR INSECTI-SOL: Floor Sweeping Compounds, Dust Retarders, Mechanics' Hand Cleaners, Shampoo Oils, Compounds for Cleaning Peas . . . and wherever else a kerosene-type product can be used and where the kerosene odor is objectionable.

SPECIFICATIONS

A.P.I. Gravity	49/50.5	Initial Boiling Point	385/395°F
Specific Gravity at 60°F	0.775/0.785	Distillation End Point	465/480°F
Saybolt Viscosity at 100°F	30/31 sec.	Unsulfonatable Residue	98%
Flash Point C.O.C.	170/180°F	Color	Water white
Fire Point C.O.C.	180/190°F	Odor	Practically none

Write for samples and further details

penn drake products

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Branches: Cleveland, O., Edgewater, N.J. Representatives in Principal Cities

Also Makers of: Rubber Solvent, VM&P Solvent, Cleaning Solvent

Prentiss Drug's durable bait station

De-Ratter De-Mouser Won't Rust

Prentiss Drug & Chemical Co.'s new bait station, "De-Ratter De-Mouser," is built of a specially-coated zinc grip steel, and is said by the firm to be non-rusting. That should make it a good tool for rodent control in moist areas.

It stands 11" high and is 13" in diameter, with a sturdily designed bottle open at both ends for convenient refills. The unit was constructed as a companion product to the company's warfarin concentrate Rax.

They're now available for delivery and you can get further information by writing the firm at 110 William St., New York 7, N. Y.

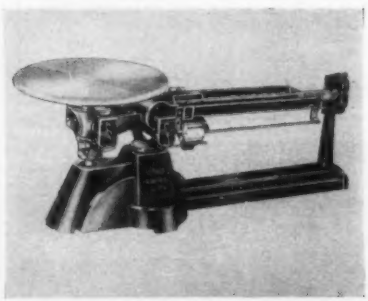
Ohaus Solves Weighing Problem

By adding an undivided tare beam to its Triple Beam Balance, Ohaus Scale Corporation has made it easier to find actual product weights without complicated calculations.

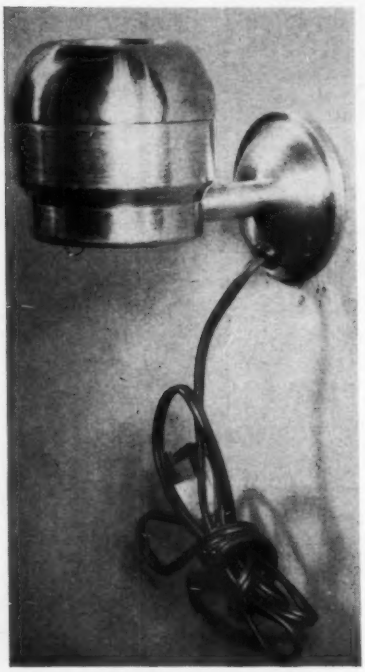
Here's how the new scale works. An empty container is balanced by use of the tare poise, which can be locked on the undivided tare rod for repetitive weighings. Values read on the balance after filling the container thus represent only the inserted material itself.

The balance has a total capacity of 2610 grams and is sensitive to 1/10 gram.

Free literature and additional information can be obtained by writing the company at 1050 Commerce Ave., Union, N. J.



Ohaus balance simplifies calculations



Economy a big feature in **Columbia** vaporizer

NSSAers See Columbia Vaporizer

On display at the recent National Sanitary Supply Association meeting in Chicago was Columbia Chemical Co.'s new insecticide vaporizer.

It's a wall type model, built of stainless steel and colored ceramic, and is equipped with a thermostatically controlled heating element and automatic safety cut-off. The unit uses only one ounce of lindane per month, an economy feature which should make it attractive to both dealers and customers. Design is in line with all federal and state safety and health requirements.

Columbia Chemical will send you more information on request. Their address: 154 E. Erie St., Chicago, Ill.

MSA Detergent Eases Cleaning

If you're having trouble keeping your personal safety equipment clean, you may find a ready answer with the new "MSA Cleaner-Sanitizer", product of Mine Safety Appliances Co.

MSA Sanitizer cuts soap waste

"Cleaner-Sanitizer" comes in dry powder form, 25 one ounce envelopes making up a carton.

Bulletin No. CM-18 of the Mine Safety Appliances Co. gives full details. Send your request to the firm at Braddock, Thomas and Meade Streets, Pittsburgh 8, Pa.

Booklet Gives Thanite Uses

Hercules Powder Co., Wilmington, Del., has prepared a free attractive eight page pamphlet on the uses and value of their insecticide toxicant, Thanite.

"Take A Good Look At Thanite" is the publication's title. The brochure points up the advantages of Thanite when used in household sprays, livestock sprays and aerosols. Test results on the compound, used alone and in combination with other insecticides, are included in table form.

Front cover of new **Hercules Powder** booklet

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The Only Sprayer that Fills the Needs of P.C.O.'s whether you use Chlordane Emulsions (water) or Oils.

Works like a motorized machine yet has no cartridge compressor, air hose or motor.

NO OTHER SPRAYER HAS THESE FEATURES

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- Rifle to carry spray 20 ft. or more.
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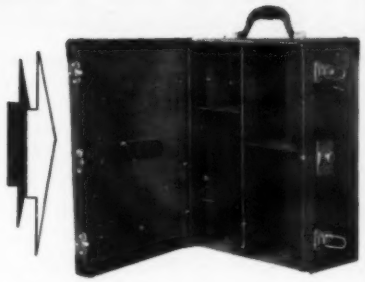

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- Light weight — easy to carry
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Pest control operators should obtain more information about their industry organization by writing

William O. Buettner
Executive Secretary
National Pest Control Association
30 Church Street
New York 7, New York

Acme ALL METAL BAIT STATION

(for control of Rats and Mice)

The Acme Bait Station provides the safest way to apply continuous baiting, safely and efficiently.

The Acme Station attaches to floor or wall with screws. Special design allows lid to open from top or front. Door is secured with padlock which is furnished. Size: 8" high, 9" wide, opening is 2½" radius.

"Danger" labels are furnished with space for imprinting your firm name.

Enjoy peace of mind and create customer confidence with the Acme Bait Station.

All metal bait station, finished in neutral color, lacquer, complete with labels and padlock. Shipped partially "knocked down" to save shipping charges. Easily assembled. Let these bait stations work for you 24 hours a day. They will save time, and are proved effective.

$1.85 each in doz. lots or $1.75 each for six doz. or more

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organization news

E. Pa. PCA Sets '53 Date

Time for the 1953 Pennsylvania PCO Shore Course is tentatively set for three days during the first full week in March. The decision was made during a recent dinner meeting of the Eastern Pennsylvania Pest Control Association at the Robert Morris Hotel in Philadelphia.

Subjects chosen to highlight next year's sessions included control data on ants, moles, ground squirrels and carpet beetles.

After dinner, the 36 attending members heard letters of appreciation from Dr. Frings and Dr. Frear, both of the Pennsylvania State College entomological staff, for their honorary memberships in the association. Dr. Frings said that proceeds from the recent short course would be applied to the John Vogel Memorial Fund.

The association's June Clinic for the display and demonstration of equipment will be held at the York Fair Grounds, York, Pa., on June 19, it was decided.

Congratulations were extended to organization secretary Joseph C. Kopf, Theodore Meyer Estate, who has been named recording secretary of the American Entomological Society, which meets regularly in the Academy of Natural Sciences in Philadelphia.

1952 association president Peter J. Salino, J. C. Ehrlick Co., Reading, presided over the meeting.

Ill. PCA Talks Insurance

The Illinois Pest Control Association at its latest meeting in the Como Inn, March 20, devoted its entire discussion period to insurance problems of the P.C.O. Dave Weisburger of B. & D. A. Weisburger, Inc., recognized as one of the country's leading authorities on insurance for the PCO, outlined a program of proper coverage for all operators, and suggested the amount and type of insurance he felt is needed for safe and thorough protection.

Keith Lewis of Pacific Mutual Life Ins. Co. followed with an account of the health and accident group policy for employers and employees developed for members of the California Pest Control Association, and explained its benefits and costs. By working as a group, the discussions brought out, things can be accomplished which an individual would find impossible.

Idaho Site Of Northwest Meet

This year's annual Pacific Northwest PCO Conference was held at the University of Idaho in Moscow, March 31-April 2. High on the meeting agenda were studies on the latest in fly and rodent control, pesticide toxicities, grain insect identification and control. Their was plenty of open discussion, to give adequate time for individual opinions.

A big dinner-dance jamboree was held in the Moscow Ad Club on closing night of the conference. Special tours were arranged for the distaff side of the delegation.

NE PCA Hears Resins Analysis

At their regular monthly meeting March 20 in Boston's Hotel Lenox, New England Pest Control Association members heard a talk by organization president Edward G. Maguire on "Synthetic Resins for Mouse Control."

Maguire's address was the second in a series of technical demonstrations to be presented by members. His material was based on the research work of one of Holland's leading chemists, and field work carried on by the William A. Maguire Co., Haverhill, Mass.

Williamson Voted Omaha Prexy

New president of the Omaha, Nebraska Pest Control Association is Jack C. Williamson, Cody Pest Control Co. Vice-presidency goes to George R. Schmid, Green Thumb Service. Roy Mason, Mason Pest Control Service, continues as secretary-treasurer.

CALENDAR OF MEETINGS

New England Home Show, Mechanics Building, Boston, Mass., May 3-11.

Tenth Annual Canadian PCO Conference, University of Montreal, Montreal, Canada, May 12-14.

Texas PCA Quarterly Meeting, Waco, May 17.

Misscuri PCA Meeting, (place to be announced) May 17.

New York PCA "Dutch Treat" Luncheon, National Republican Club, New York City, May 20.

Georgia PCA Spring Meeting, Albany, Ga., May (exact date to be announced).

Chemical Specialties Manufacturers Ass'n, 38th Mid-Year Meeting, Hotel Sheraton-Plaza, Boston, Mass., June 8-10.

E. Pennsylvania PCA June Clinic, York Fair Grounds, York, Pa., June 19.

Manufacturing Chemists Ass'n, Annual Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va., June 23-24.

Forest Products Research Society, Annual Meeting, Milwaukee, June 23-25.

New Jersey PCA One Day Clinic on Wood Destroying Insects Other Than Termites, Rutgers University, New Brunswick, July 23.

National Ass'n of Sanitarians, Annual Meeting, Shirley-Savoy Hotel, Denver, Colo., Sept. 2-5.

Tennessee PCA Fall Meeting, Andrew Jackson Hotel, Nashville, Sept. 14-15.

Iowa PCA Fall Meeting, Sioux City, Sept. 25-26.

National Pest Control Assn. 20th Convention, Rice Hotel, Houston, Texas, Oct. 20-22.

Pomerantz At Conn., NE Dinner

Charles Pomerantz, discoverer of the mite carrying rickettsialpox, gave an illustrated talk on "Of Mice and Mites" before a combined dinner meeting of the Connecticut and New England Pest Control Associations, April 22, in Hartford, Conn.

Members got together over a tasty roast beef dinner at the Hotel Bond before Pomerantz' discussion.

Dolin Addresses PEA

How to use insecticides and rodenticides, and what precautions to take in application was the topic analyzed by B. H. Dolin at the April 14 meeting of the Professional Exterminators Association in New York City.

Dolin is on the staff of the New York State Department of Labor.

A. F. C. QUALITY PRODUCTS FOR PEST CONTROL

Chlordane, oil concentrate, liquid emulsifiable concentrate, wettable powder concentrate, and ready-to-use liquids and powders.

Super Fluorex V, powerful insecticide powder

Sodium Fluoride

Poison Seeds

Pyrethrum and **DDT,** powders and liquids

Paradichlorobenzene

FOR EFFECTIVE RAT CONTROL

Phosphorous Paste
Rumetan (Zinc Phosphide)
Fortified Red Squill Extract and Powder
Antu and **Antu Tracking Powder**
Thallium Sulphate
Barium Carbonate
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NATIONAL PEST CONTROL ASSOCIATION

Inquiries cordially invited.

There is, of course, no obligation.

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1440 Broadway, New York City 18, N. Y.

Stop Pigeons, Starlings, Sparrows,

with Grosley's

'NO ROOST'

Imitated by others, equalled by none.

Water repellent, will not melt in extreme heat

Used Successfully By Leading PCOs

The Simple, Economical Way to Eliminate Bird Roosting

GROSLEY'S "NO ROOST" IS

POSITIVE: It is a physical impossibility for birds to roost in the area where formula is applied.

ECONOMICAL: It eliminates needless expense in building maintenance, in keeping ledges, roofs, sills, etc., free from bird mess. One gallon is enough to bird-proof 150 running feet.

LAWFUL: It complies with ALL city, state and humane laws. It cannot injure birds.

SAFE: It is **non-poisonous,** cannot harm anyone applying it.

CAN BE APPLIED TO ANY BUILDING, or electric sign. **Protects for a FULL YEAR** under most climatic conditions.

Write Today for Prices and Literature

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Good Looking Cases Add Prestige To Your Job!

And, they are not expensive. Just check these attractive prices . . . and mail your ORDER TODAY!

"Standard" 18"x12"x7" $11.85

"Special No. 3" 18"x8"x10½" $10.85

"Round" — 25"x8½" dia. for 3 gal. tank type sprayer $13.50

All inside dimensions shown are approximate
IN STOCK FOR IMMEDIATE DELIVERY
All prices F.O.B. New York

PCE

PEST CONTROL EQUIPMENT CO.

47 W. 43rd St. VAnderbilt 6-5390 New York 18, N. Y.

PERSONAL BRIEFS

News this month is mixed with sadness and joy, so let's start from the far west and move eastward. From HAWAII comes news of the death of Hal Hilts of Hilts Laboratories who succumbed to a heart condition during March. Mr. Hilts is known as the man who really started pest control on a commercial scale over there, differing from the "one man" operation carried on prior to that time. He was the first NPCA member in Hawaii. Leonard Bishop, Mr. Hilt's brother-in-law, will carry on the company . . . Karl and Mrs. Hassler, of Neil A. Maclean Co. in Los Angeles, spent about three weeks in Honolulu educating Ernie Forde of Chemtox on how to fumigate for drywood termites. Karl says, "Ernie gets me up for breakfast at seven and lets me go home about midnight." What did you expect?—To go swimming all the time? . . . From PUEBLO, Colorado, we learn that Horace Leonard Hutchison, of Hutchison Pest Control Co, passed away early in March. He was known to his intimate friends as "Hutch," a nickname also given to one of his sons, E. B. Hutchison, who, with his mother, will conduct the affairs of the company. . . , From ATLANTA, Georgia comes the good news that Orkin's vice-president, Ted Oser is now happily married and has two fine children: a son fifteen and a little daughter five. To entice us to visit him, Ted reports he's set up a still in the backyard and that mint-juleps will be on the house the next time we're in Atlanta. Last time I visited the "Sunny South" it rained all the while! . . .

A letter from DAYTON, Ohio carries word of the untimely death of Mrs. W. H. McCain, whose husband heads Extermital Chemicals, Inc. in that city. Bill and Mrs. McCain had driven to Spring Mill Inn in Bedford, Indiana to spend a few days of rest. They had stopped for a traffic light when a truck rammed into the rear of their car. Mrs. McCain apparently died of shock on the following Tuesday . . . Congratulations are in order for Ward's Natural Science Establishment in ROCHESTER, New York, which is celebrating its 90th anniversary this year. If you're ever in that city, drive out to see their place of business. It's nestled amidst a heavily wooded area with a stream and lake to make just about one of the most perfect places to work we've ever seen. . . . Reader Frank H. Moseley, proprietor of Scotia Pest Control in HALIFAX, Nova Scotia, writes that an automobile accident involving both his sister and himself has curtailed their business activities during the last six months. The misfortune happened in October, but both are raring to go now. The rest must have been good for business, he adds, "because there has been an increase in yearly contracts of 50% since January." Good news all around for the Mosleys. . . . See you come June when we're all in the midst of our busiest season.

For a Sure

KILL

Asarco Brand

THALLIUM SULPHATE

For years the first choice of a multitude of PCOs in the control of pests and rodents.

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1-4 lbs.	$13.00/lb.
5-9 lbs.	$11.50/lb.
10 lbs. or more	$10.50/lb.

All prices F.O.B. Denver, Colo., with transportation charges allowed to U.S.A. destination.

Prices subject to change without notice

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Ten thousand cockroaches are are being used by University of North Dakota scientists in experiments to discover how Coxsackie virus disease is transmitted.

CLASSIFIED ADVERTISEMENTS

When answering ads where box number only is given, please address as follows: Box number, c/o Pest Control, 1900 Euclid Building, Cleveland 15, Ohio.

Rates: "Position Wanted" 5c per word, minimum, $1.00. All other classifications, 10c per word minimum $2.00. All classified ads must be received by Publisher at least two weeks preceding publication date and be accompanied by cash or money order covering full payment.

WANTED MANAGERS

For branch offices. Rapidly expanding pest control firm requires high-type men to manage offices. Must have initiative, sales ability and forcefulness. Prefer graduate entomologist with practical experience. Will also consider applications from men now in the pest control field, who possess good education, sound technical and business background. Excellent opportunity to become associated with progressive organization enjoying solid financial position. Salary and percentage. Submit complete data: age, education, experience and other pertinent details, together with photo. All replies strictly confidential. Mr. L. L. Crosby, President, Commonwealth Sanitation Co., 3567 Bigelow Blvd., Pittsburgh 13, Penna.

WANTED
CHEMIST - ENTOMOLOGIST

Outstanding man to head service department of large, rapidly expanding pest control firm with home offices in Pittsburgh and branches in 18 cities. Candidate should have seasoned experience in insect toxicology, economic entomology and field work. This is an important position for a man possessing managerial ability Plus. Salary commensurate with ability and experience. All replies strictly confidential. Submit account of academic and professional training, past affiliations, earnings, photo and any other pertinent facts to: Mr. L. L. Crosby, President, Commonwealth Sanitation Co., 3567 Bigelow Blvd., Pittsburgh 13, Penna.

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Will buy your surplus methyl bromide and cyanide discoids. Oser Exterminating Co., 822 14th St., Denver, Colo.

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Spraying Systems **TeeJet** Nozzles are available in any capacity desired. Nozzle assembly includes interchangeable orifice tip and strainer. Precision built for perfect pattern and perfect performance. Write for information.

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liquid particles distributed evenly over entire pattern area
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The most potent insecticide may lose sales for you if not properly masked. Penick offers many superior masking agents, each skillfully compounded for unusually pleasing residual odor and full coverage.

NEW MOWN HAY #7627	3.00 LB.	MINT #7514	2.00 LB.
FOUGERE #7531	3.60 LB.	CITRONELLA #7482	2.55 LB.
GARDENIA #7524	3.60 LB.	NARCISSUS #7527	3.60 LB.
JASMINE #7530	3.00 LB.	PENTHANCO #5454	2.50 LB.
LILAC #7455	3.60 LB.	PENVAL #7321	2.15 LB.
LILY OF THE VALLEY #7561	3.60 LB.	ORANGE BLOSSOM #7528	3.60 LB.

Economical—they usually require only 1 pound per drum of finished insecticide!

For Para blocks, Penick offers a wide range of equally effective deodorants. We will gladly discuss your odor-masking problem at no obligation.

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  Packed in 4 and 16 oz. containers or in Bulk
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- ★ **Per-Mo Rat Paste, Made With Antu**
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pestales

Artful Dodger

Our London correspondent, A. Pffeuffnig, is at it again. This time he reports an elusive mouse, apparently well-schooled in the ways of the East End slums, recently escaped the unwelcome attentions of eight cats and two dogs, as well as an irate woman shopper. As the woman left her home, the mouse, with eight drooling cats right behind, leaped unnoticed into her shopping bag. When the woman reached her car, she set the bag on the seat beside her two pet dogs. The mouse wisely stayed inside. Upon arriving at the store, the woman took her bag in hand and went inside. The heavenly odors, apparently, were too much for the vagrant mouse. He leaped from the bag. The housewife screamed, the dogs barked, there was a flurry of feminine feet towards the nearest counter, and several stacks of cans toppled in the confusion.

Pffeuffnig, on the scene buying horse-meat for his pet orangatang, reports that Scotland yard was called, but could find no tangible evidence.

Should have called a Limy PCO instead.

* * *

New Slant

An Irish farmer recently drowned 25 mice in a single night, by sprinkling chaff on a tub of skimmed milk so that it appeared filled with straw.

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Pest Control Notebook

(from page 44)

Color is something like that of the German roach. It is a mottled tan but with a pinkish cast along wing edges and collar. The lobster design on the collar is tan on a black background. There is a cream colored dot on each edge of the abdominal segments on their upper surface. On the under surface, the abdominal markings are shaped something like the numeral 7.

More information on lobster roaches will be printed as more specific information is collected.

CSMA June Meeting

(from page 26)

investigations of the mode of action of insecticides is included in the closing paper being given by Andrew J. Forgash, research fellow in the department of entomology, Rutgers University, New Brunswick, N. J.

Registration forms for this outstanding meeting will be sent if you request them from Dr. H. W. Hamilton, Chemical Specialties Manufacturers Association, 110 East 42nd Street, New York, N. Y.

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